APPENDIX L

AGENCY COMMENTS AND NAVY RESPONSES TO COMMENTS FOR THE DRAFT PA/SI REPORT

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005

Comment Number	Comment	Response
	General Comments from Patty Wong-Yim, Ph.D., Human and Ecological Risk Division (HERD)	
1	**Human Health Risk Assessment Methodology and Criteria:** Conceptual Site Model: Residential Scenario: Figure 9 illustrates a conceptual site model (CSM) for the Ballfields Parcels. The CSM reveals all complete exposure pathways under the recreational visitor scenario, which is the most relevant receptor based on future land use. However, the PA/SI report provides a conservative HHRA for the site by evaluating the hypothetical residential receptor. HERD concurs with the Navy on conducting the residential HHRA to support unrestricted land use decisions for the Site. However, the CSM should also be correlated to the residential receptor evaluated in the HHRA. By listing the residential and visitor receptors side-by-side in the CSM, we can effectively compare differences in exposure pathways between the two scenarios. Please add the residential receptor to the CSM.	The hypothetical residential receptor has been added to the CSM (Figure 9).
1 (Continued)	Construction Worker Scenario: Considering potential dredging activities may take place along the PDD and trenching activities for utility installations, we recommend the Navy include a construction worker scenario in the HHRA. The HHRA identifies arsenic at a major risk driver and low levels of volatile organic chemicals (VOCs) were detected in soil and groundwater. Potential construction worker exposure to these chemicals should be evaluated, especially direct dermal contact with the groundwater during trenching activities.	The Navy believes that incorporation of a construction worker scenario is not necessary because trenching and/or dredging activities are currently not occurring at the Ballfields Parcels, and based on a letter issued by the California Coastal Conservancy (CCC), plans to redevelop the Ballfields Parcels to a seasonal wetlands will not include any dredging of the PDD or any earthmoving activities; thus, the Navy proposes to focus on those revisions that have a real potential of effecting the decision making process at the site. A construction worker scenario does not appear to be a potential exposure scenario at the site given the current and planned future use. Furthermore, the results of such an evaluation would ultimately not effect the decisions made at the site because the CCC is not planning any construction activities. For example, if a construction worker scenario were included in the PA/SI Report and the results indicated there was a potential risk, the most likely course of action would be to prepare a Land Use Covenant (LUC) that requires a soils management plan be prepared by any future developer that was planning to dig into soil/groundwater at the site. Considering CCC will not be digging into soil/groundwater, and will only be covering the property with dredged material, a soils management plan would ultimately not need to be prepared and the time and effort that was required to complete the construction worker scenario would not result in the project being completed any differently.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
2 (a)	Chemicals of Potential Concern Identification: Depth of Soil Sample: Section 5.1 (Page 35, 2nd paragraph) indicates that surface soil samples were collected from 0 to 6 inch bgs and subsurface soil samples were collected from 2 to 6 ft bgs. Due to the presence of shallow groundwater underneath the site (average 5.5 ft bgs), we concur with the limited depth for subsurface soil samples. However, the document does not explain why there is a gap between surface and subsurface soil (between 6 inch and 2 ft bgs). Please clarify.	The soil sampling was conducted in accordance with the Final Sampling and Analysis Plan (SAP) that was a part of the agency-approved Work Plan for the Ballfields Parcels. Section 2.2.1 of the SAP states: *"at each of these 16 [subsurface] boring locations, one sample will be collected from the surface (i.e., 0-6 inches bgs) and one from the subsurface (i.e., between 1 ft bgs and the top of the groundwater table). The cores will be visually inspected for evidence of contamination and PID measurements will be taken to screen for organic compounds. The results of the visual inspection and PID screening will be noted in the field logbook. If the visual inspection and/or PID screening indicate contamination, a sample will be collected from that interval. If there is no evidence of contamination in the subsurface portion of the core, a sample will be collected from a depth nearest the groundwater table."* Note that evidence of contamination was not observed, nor were any PID measurements above background levels during the entire duration of sampling activities at the Ballfields Parcels; therefore, the subsurface soil sampling interval was collected from the depth nearest the groundwater table in accordance with the Final SAP. Groundwater was not encountered at a depth shallower than 2 ft bgs, which is the reason no soil samples were collected between 6 inches and 2 ft bgs.
2 (b)	Background Inorganic Thresholds: Table 7 and Appendix E provide background inorganic levels adopted from the Final Human Health and Ecological Risk Assessment BRAC Property Hamilton Army Airfield (IT and CH2M Hill, 2001). However, DTSC records suggest that we did not approve these background thresholds nor accepted this final document. Instead, the Army agreed to use the DTSC calculated background thresholds for risk assessment of Hamilton Army Airfield (DTSC, 2004, attached). Unless the Navy furnishes a proof of acceptance on its background data, we recommend the Navy use the inboard soil/sediment background thresholds from Hamilton Army Airfield for risk assessment of the Ballfields Parcels. Please find the DTSC technical memorandum on background threshold calculation in the attachment (Attachment 1) and amend the inorganic chemicals of potential concern (COPCs) selection in the HHRA (Table 7).	The Navy has reviewed the DTSC technical memorandum on background for the North Antenna Field (NAF) of the Hamilton Army Airfield. In most instances, background concentrations are similar to the background concentrations used in the HHRA which were obtained from the Final Human Health and Ecological Risk Assessment BRAC Property Hamilton Army Airfield (IT and CH2M Hill, 2001). Based on a brief evaluation of the North Antenna Field background values to maximum concentrations detected at the Ballfields Parcels, it appears as though the site-wide results of the HHRA would not significantly change because lead and chromium would remain as COPCs. Similarly for the ecological evaluation, cadmium, chromium, mercury, and lead would remain as COPECs. The only difference for the ecological evaluation would be that zinc would not be a COPEC, but vanadium would be a COPEC. Estimates of HQ high and low

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
2 (b) (Continued)		would be similar to zinc (i.e., HQ_{high} <1.0, 1.0<HQ_{low} <10). Furthermore, the Navy believes that the background concentrations obtained from the Final Human Health and Ecological Risk Assessment BRAC Property Hamilton Army Airfield (IT and CH2M Hill, 2001) are appropriate for use in the PA/SI because they were acceptable for use in the Final Human Health and Ecological Risk Assessment BRAC Property Hamilton Army Airfield (IT and CH2M Hill, 2001), which was one of the primary documents referenced in the Finding of Suitability for Early Transfer (FOSET) for the Main Airfield Parcel (2003). In addition, the BRAC background concentrations were deemed acceptable and used as action levels in the Main Airfield Parcel ROD/RAP (2003) and the Focused Feasibility Study for the Inboard Area (2001) In addition, as noted in the PA/SI, the background threshold concentrations were assumed to be appropriate for use at the Ballfields Parcels because the BRAC property is located adjacent to the Ballfields Parcels where the soil type is similar, consisting of fill, desiccated Bay Mud, and saturated Bay Mud. The North Antenna Field, which is located north of the BRAC property next to San Pablo Bay, likely has a different geological composition than the Ballfields Parcels just based on its location near the bay, and therefore background values for the North Antenna Field would not be appropriate for the Ballfields Parcels.

Comment Number	Comment	Response
3 (a)	Exposure Pathways: Indoor Air Exposure: Under the residential scenario, HERD considers the vapor intrusion to indoor air as a complete pathway. In the absence of the evaluation of indoor air risk for VOCs released from soil and groundwater, we cannot concur with the Navy that human exposure through inhalation of indoor air is insignificant as compared to direct contact to soil and groundwater. We recommend the Navy to provide the appropriate indoor air risk evaluation to support this statement.	The Navy believes that the vapor intrusion to indoor air exposure is not a significant route of exposure and would not significantly affect the results of the risk assessment. As indicated in Table 4 and on Figure 7 of the PA/SI, volatile organic compounds were not frequently detected across the site, but rather sporadically detected, and in most cases concentrations detected were at estimated levels below the method detection limit. Furthermore, the vapor intrusion to indoor air is currently not a complete pathway, nor will it be complete in the future. According to information provided in a letter issued by the CCC, buildings will not be constructed on the property in the future. However, the Navy has included the vapor intrusion to indoor air as a complete pathway for the hypothetical residential receptor in order to provide support that inhalation of indoor air is insignificant. Risk and hazard for VOCs in groundwater were estimated using the DTSC modified Johnson & Ettinger spreadsheet, whereas the risk and hazard for VOCs in soil were estimated using U.S. EPA's Johnson & Ettinger spreadsheet modified to account for DTSC-specific toxicity values for naphthalene, methylene chloride, benzo(b)fluoranethene, and chrysene (note DTSC does not provide a soil to indoor air modified Johnson & Ettinger spreadsheet). A slab on grade building was assumed in conjunction with spreadsheet default settings. VOCs evaluated for vapor intrusion included all compounds detected in soil and groundwater that are listed in Table 1 " List of Chemicals to be Considered for the Vapor Intrusion Pathway" provided in DTSC's *Guidance for The Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (2004). In response to DTSC's comment 5(c) on page 11, indoor air risk/hazard was only calculated based on the Site-wide approach, rather than providing indoor air risk/hazard for each AOPC. The estimated indoor air risks/hazards are as follows:
3 (a)		

Comment Number	Comment	Response
(Continued)		

Analyte	Soil to Indoor Air		Groundwater to Indoor Air	
	Risk	Hazard	Risk	Hazard
2-Methylnaphthalene	NA	6.7E-04	NA	1.1E-05
Acetophenone	NA	6.1E-04	NA	3.2E-07
Benzaldehyde	NA	1.3E-03	NA	1.5E-06
Benzo(b)fluoranthene	4.8E-09	NA	ND	ND
Chrysene	9.6E-10	NA	ND	ND
Fluorene	ND	ND	NA	2.8E-07
Naphthalene	5.6E-07	1.3E-02	1.7E-08	4.0E-04
Pyrene	NA	9.8E-07	NA	6.0E-08
cis-1,2-Dichloroethene	ND	ND	NA	1.2E-02
trans-1,2-Dichloroethene	ND	ND	NA	3.8E-04
1,3-Dichlorobenzene	ND	ND	NA	4.7E-05
Acetone	NA	5.7E-03	ND	ND
Benzene	ND	ND	1.8E-07	5.0E-04
Bromomethane	ND	ND	NA	1.7E-02
Methylene chloride	3.1E-06	1.8E-02	ND	ND
Toluene	ND	ND	NA	4.3E-04
Trichloroethene	ND	ND	4.0E-08	7.8E-05
m,p-Xylenes	NA	2.3E-02	ND	ND
o-Xylenes	NA	9.2E-03	ND	ND
Total	3.7E-06	7.1E-02	2.4E-07	3.0E-02

NA – endpoint not applicable for the COPC
ND – COPC not detected in the environmental medium

Note that methylene chloride was the only COPC exceeding a $1x10^{-6}$ risk level. This COPC was detected in only one of 32 samples at a concentration of 3.5 µg/kg. Note also that methylene chloride is a common laboratory contaminant.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
3 (b)	Groundwater Exposure: We understand that groundwater underneath the site may not be suitable for support domestic uses, due to low recharge rate and high TDS. However, unless the San Francisco Regional Water Quality Control Board (RWQCB) considers the groundwater underneath the site as non-portable, HERD assumes domestic use of groundwater for the residential receptor. The HHRA estimates a groundwater risk of 1.3E-2 and a groundwater hazard index (HI) of 14 at the Ballfields Parcels. We advise consulting the RWQCB on potential uses of groundwater at the site and mechanisms to minimize potential human exposure to the groundwater.	RWQCB general comment no. 3 on the Draft PA/SI Report (see page 30 of these responses to comments) states, "Staff agrees with statements in the PA/SI that groundwater is not considered a potential source of drinking water." Data collected from the adjacent BRAC parcels indicate total dissolved solids are above 3,000 mg/L which triggers an exception to the policy designating groundwater as a source of drinking water. In the event that Base Cleanup Team (BCT) members find it necessary to prevent the consumption of groundwater by mechanisms such as deed restrictions, the Navy will work with the regulatory agencies to ensure such controls are in place; however, given that total dissolved solids are too high for the groundwater to be considered a drinking water source (as agreed to by the RWQCB), additional controls do not seem to be warranted In fact, because groundwater was not considered a viable source for municipal or domestic water supplies at the BRAC parcels due to low yield and high TDS, the Army did not have to include a groundwater deed restriction in its "Covenant to Restrict Use of Property" (2003) available at DTSC's website (http://www.dtsc.ca.gov/database/Calsites/Deed_List_County.cfm).
4 (a)	Risk Evaluation and Toxicity Criteria: Naphthalene: We concur with the Navy to use the Cal-Modified residential soil preliminary remediation goal (PRG) for naphthalene in soil risk calculation. However, the HHRA adopts the USEPA Region IX tap water PRG for naphthalene (6.2 µg/l) in groundwater risk evaluation. The Cal-Modified tap water PRG for naphthalene is 9.3E-2 µg/l (USEPA, 2004). DTSC guidance (DTSC, 1994a) recommends the use of the Cal-Modified PRGs in place of the USEPA Region IX PRGs, whenever available. Please amend all the corresponding groundwater risk calculations on naphthalene (Tables F-12, F-13, F-18, and F-19).	As stated in Section 5.3 of the HHRA, Cal-modified PRGs were used when available; however, the Cal-modified PRG for naphthalene was inadvertently overlooked. The HHRA has been updated to include the use to the Cal-modified PRG for naphthalene.
4 (b)	2-Methylnaphthalene: HERD recommends the Navy adopt the USEPA Region IX naphthalene PRGs for 2-methylnaphthalene in a screening HHRA. Please also be aware that USEPA developed an oral reference dose (RfDo) of 4E-3 mg/kg-day for 2-methylnaphthalene (USEPA, internet). If it becomes necessary to conduct a quantitative baseline HHRA for the site, we suggest use of this RfDo to derive the chemical hazard for 2-methylnaphthalene. We also recommend the use of the RfDo to estimate risk from inhalation and dermal exposure to 2-methylnaphthalene, based on a route-to-route extrapolation.	The HHRA has been revised to include the U.S. EPA Region IX naphthalene PRGs for soil and tap water for 2-methylnaphthalene.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
4(c)	Lead: Unlike the USEPA Region IX PRGs, which are derived solely based on risk assumptions, the California Drinking Water Action Levels (DWALs) also incorporate economic feasibility into their final values. Due to the lack of tap water PRG for lead, we concur with a qualitative risk evaluation of lead in groundwater using the DWAL of 15 µg/l. However, because the DWAL for lead is higher than the California Public Health Goal for lead in drinking water (2 µg/l, OEHHA, 1997), we recommend the Navy include a statement to discuss the uncertainty in risk from exposure to lead in groundwater.	The uncertainty discussion related to lead has been revised as follows: The Public Health Goal (PHG) adopted by California EPA for lead in drinking water is 2 µg/L, which is based on noncarcinogenic effects. California EPA also derived a PHG of 6 µg/L for lead for carcinogenic effects. A PHG is a concentration in drinking water that poses no significant health risk if consumed for a lifetime, based on current risk assessment principles, practices, and methods. At seven of the Ballfields AOPCs (R1 through R5, RSP, and SPN) lead concentrations in groundwater ranged from 4 µg/L to 424 µg/L. Concentrations in all seven samples exceed the adopted noncarcinogenic PHG of 2 µg/L, and six of the seven lead concentrations exceed the carcinogenic PHG of 6 µg/L. Therefore, estimates of cancer risk and noncancer hazard have been underestimated in these seven AOPCs, assuming groundwater will be used for domestic purposes, which is not likely given the planned future use of the property and total dissolved solids concentrations above 3,000 mg/L. In the event that BCT members find it necessary to prevent the consumption of groundwater by mechanisms such as deed restrictions, the Navy will work with the regulatory agencies to ensure such controls are in place; however, given that total dissolved solids are too high for the groundwater to be considered a drinking water source (as agreed to by the RWQCB), additional controls do not seem to be warranted.
4 (d) 4 (d) (Continued)	Polychlorinated Biphenyls: The HHRA calculates total polychlorinated biphenyl (PCB) concentration using a method established by the National Status and Trends (NS&T), National Oceanic and Atmospheric Administration (Section 4.2, page 22 and Table 6). The PCB list from NS&T contains only 18 congeners. These congeners were selected to represent the major congeners in most coastal environments. Results of record search suggest previous handling of PCBs in Building 193. This provides a potential source of PCB contamination detected in the building. Therefore, we do not believe that the coastal environments can suitably describe the PCB contamination in Building 193. More importantly, results of congener analysis reveal the presence of PCB 126 in soil samples. Although this congener has the highest toxic	Note that the analysis of PCBs was performed consistent with discussions that were had with the regulatory agencies prior to the sampling activities. In order to address DTSC's concerns regarding the presence of various PCB congeners, dioxin-like congeners in particular, the Navy performed a revised PCB risk evaluation using the DTSC suggested methodology. Dioxin-like congeners were identified as PCB 105, 118, 170, and 180. Concentrations were adjusted by their respective WHO TEF, summed, and then divided by the TCDD PRG:

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<td>equivalency factor (0.1) according to the 1997 World Health Organization (WHO) toxic equivalent factor (TEF) scheme (Van den Berg et al., 1996), it is not included in the PCB list from NS&T. Taken together, we disagree with the total PCB concentration calculation method used in the HHRA. HERD recommends the Navy follow the PCBs: Cancer-Dose Response Assessment and Application to Environmental Mixture (USEPA, 1996) and Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures (USEPA, 2000) to derive total PCB risk for Building 193. In addition, the 1997 WHO TEF scheme for each dioxin-like PCB congener should be adopted. Briefly, PCB risk should be calculated as follows:

Toxic equivalent concentration for dioxin-like PCB congeners
$= \sum_{i=1}^{n} (\text{dioxin - like PCB congener conc}_i \times \text{TEF}_i)$
Dioxin-like PCB risk
$= \frac{\text{toxic equivalent conc. for dioxin - like PCB congeners}}{\text{PRG for 2,3,7,8 - TCDD}}$
Non-dioxin-like PCB risk
$= \frac{\sum_{i=1}^{n} \text{non-dioxin-like PCB congener conc.}_i}{\text{PRG for Aroclor 1254}}$
Total PCB risk =
$(\text{dioxin - like PCB risk}) + (\text{non - dioxin - like PCB risk})$

where, residential soil PRGs for 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) and Aroclor 1254 are 3.9E-6 mg/kg and 2.2E-1 mg/kg, respectively.</td>
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<table>
<tr><th>Dioxin-like PCB</th><th>Toxic Equivalent Factor (TEF)</th><th>TEF-Adjusted Maximum Concentration (mg/kg)</th></tr>
<tr><td>Cl5(105)</td><td>0.0001</td><td>1.6E-07</td></tr>
<tr><td>Cl5(118)</td><td>0.0001</td><td>4.0E-07</td></tr>
<tr><td>Cl7(170)</td><td>0.0001</td><td>1.1E-07</td></tr>
<tr><td>Cl7(180)</td><td>0.00001</td><td>1.9E-08</td></tr>
<tr><td colspan="2">Concentration Sum (mg/kg)</td><td>6.9E-07</td></tr>
<tr><td colspan="2">Risk Estimate (unitless)</td><td>1.8E-07</td></tr>
</table>
<table>
<tr><th>Non-Dioxin-like PCB</th><th>Maximum Concentration (mg/kg)</th></tr>
<tr><td>Cl2(8)</td><td>1.0E-04</td></tr>
<tr><td>Cl3(18)</td><td>5.0E-05</td></tr>
<tr><td>Cl3(28)</td><td>2.0E-04</td></tr>
<tr><td>Cl4(44)</td><td>4.7E-04</td></tr>
<tr><td>Cl4(52)</td><td>1.4E-03</td></tr>
<tr><td>Cl4(66)</td><td>1.5E-04</td></tr>
<tr><td>Cl5(101)</td><td>5.6E-03</td></tr>
<tr><td>Cl6(128)</td><td>1.4E-03</td></tr>
<tr><td>Cl6(138)</td><td>7.9E-03</td></tr>
<tr><td>Cl6(153)</td><td>7.9E-03</td></tr>
<tr><td>Cl7(187)</td><td>1.1E-03</td></tr>
<tr><td>Cl8(195)</td><td>3.6E-04</td></tr>
<tr><td>Cl9(206)</td><td>5.9E-04</td></tr>
<tr><td>Cl10(209)</td><td>3.9E-04</td></tr>
<tr><td>Concentration Sum (mg/kg)</td><td>2.7E-02</td></tr>
<tr><td>Risk Estimate (unitless)</td><td>1.2E-07</td></tr>
</table>
The estimated carcinogenic risk for these dioxin-like congeners is 1.8×10^{-7}.

The remaining PCB congener concentrations were summed and the total divided by the Aroclor 1254 PRG. The estimated carcinogenic risk for these congeners is 1.2×10^{-7}.

Summing the carcinogenic risk for both types of PCB congeners results in an estimated risk of 3.0×10^{-7}, which is actually less than the risk estimated in the HHRA (i.e., 3.2×10^{-7}).

The revised PCB risk calculations have been included in the HHRA.
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Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
4 (e)	Molybdenum: According to analytical data reported in Appendix C and data summarized in Table 7, molybdenum was detected in soil sampled from all AOPCs, but non-detected in background soil. However, soil risk summary tables in Appendix F do not include the metal in their hazard quotient calculations. Please clarify whether the metal was detected in soil. If the metal was detected, please do include the metal as a COPC in the hazard calculation of each AOPC.	According to the analytical results for molybdenum, this metal was not detected. As defined by the data validation company, the "<" before the numerical result indicates that the analyte was analyzed for but not detected, while the "J" after the numerical result indicates the sample detection limit is an estimated value. In those cases where the sample detection limit is qualified as estimated it is because the analytical laboratory did not meet the frequency of analysis for the ICP interference check sample analysis. When the frequency of analysis for the ICP interference check is not met, the results are qualified as estimated even if they are nondetect as with molybdenum in this case. Therefore, because molybdenum was not detected in the samples, it was not identified as a COPC and was not evaluated in the HHRA.
4 (f)	2,6-Dinitrotoluene: Table F-11 reveals that 2,6-Dinitrotoluene (2,6-DNT) was detected in soil sampled from Building 193, with a concentration of 0.2 mg/kg and data qualifier of "NJ". Although the site-wide risk calculation (Table F-11) includes 2,6-DNT as a COPC, the chemical was not included as a COPC for Building 193. Please amend.	The hazard index (HI) has been revised to include 2,6-DNT at Building 193. Note that the hazard quotient (HQ) for 2,6-DNT provided for the Site-Wide calculations is the same as the HQ for Building 193 (i.e., 0.003). The HI for Building 193 remains at 0.1 after incorporating the HQ of 0.003.
4 (g)	Chemical Surrogates: The report reveals that 2-methylnaphthalene, acenaphthylene, and acetophenone were detected in soil and groundwater samples. Benzo(g,h,i)perylene and phenanthrene were detected only in soil samples, whereas 4-chloro-3-methylphenol and lead were detected only in groundwater samples. Because PRGs are not available for these chemicals, the HHRA excludes these chemicals in the risk calculation (Appendix F). In accordance with the USEPA (1989) and DTSC (1994b) risk assessment guidance, we recommend using the chemical surrogates below to estimate potential human health risk from exposure to these chemicals.	These risk calculations have been revised to include the surrogate compounds recommended by DTSC, which are listed in Attachment 1 to these responses to comments. For soils, the revised total site-wide risk remains at 1.6×10^{-6} and the revised soil site-wide HI remains 0.2. Similarly for groundwater, the revised total site-wide risk and HI remain the same at 1.3×10^{-2} and 14, respectively.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
5 (a)	Risk Characterization: Indoor Air Risk from Volatile Organic Chemicals in Groundwater: We disagree with Section 5.4.2 (5th paragraph of page 41), "*Because these COPCs are not VOCs, the hazard associated with inhalation of volatiles present in groundwater is not a concern.*" HERD considers volatile chemicals as chemicals with a Henry's Law constant of 1E-5 atm-m^3/mole or greater and with a molecular weight less than 200 g/mole (DTSC, 1994b). Based on these criteria, 2-methylnaphthalene is a VOC (Henry's Law constant of 5.17E-4 atm-m^3/mole and molecular weight of 142 g/mole). Since 2-methylnaphthalene was excluded from the groundwater risk evaluation because PRGs were not available for the chemical, we disagree with the above statement. Instead, we recommend the use of chemical surrogates to derive chemical risk for all organic chemicals without available PRGs. Also, the screening HHRA should include the indoor air risk evaluation to demonstrate that there is minimal risk from exposing to VOCs released from groundwater. Please amend.	Chemical surrogates have been included to derive chemical risk for all organic chemicals that do not have PRGs. Please refer to the response to comment 4(g) from Patty Wong-Yim, Ph.D on page 9 for a summary of risks associated with chemical surrogates. In addition, please refer to the response to comment 3(a) provided by Patty Wong-Yim, Ph.D on page 5 for a summary of the calculated indoor air risks.
5 (b)	Outdoor Air Risk from Volatile Organic Chemicals in Groundwater: We understand that human exposure to VOCs in outdoor air is negligible and this pathway is normally not evaluated in the screening HHRA. We concur with the HHRA that no outdoor air risk evaluation is necessary, since only low level of VOCs were detected in soil and groundwater at the Ballfields Parcels.	Comment noted.
5 (c)	Groundwater Risk: The draft PA/SI report provides a HHRA for each AOPC and a site-wide HHRA. Considering the relative small footage (18 acres) of the site and potential migration of contaminants in groundwater, we recommend using the site-wide HHRA results for site management decisions.	We agree that the site-wide HHRA results should be used to make site management decisions and this is what the Navy plans to do in the revised PA/SI document.
6 (a)	Uncertainty Discussion: Chemicals of Potential Concern Selection: Instead of discussing uncertainties contributed by excluding COPCs from the HHRA due to PRGs are not available, we recommend the use of chemical surrogates in risk and hazard calculations and discuss the uncertainties of adopting these chemical surrogates in the risk assessment.	Chemical surrogates have been included as described in the response to comment 4(g) on page 9. The uncertainty discussion has been revised to discuss the use of chemical surrogates as follows: Several of the COPCs selected for soil (2-methylnaphthalene, acenaphthylene, acetophenone, benzo(g,h,i)perylene, and phenanthrene) do not have U.S. EPA Region 9 PRGs. Therefore, PRGs of chemical surrogates were used to estimate risk and hazard. Chemical surrogates were recommended by DTSC based on structural similarities and/or toxicity properties. 2-Methylnaphthalene was the only COPC evaluated as a carcinogen based on its structural similarity to naphthalene. Based on U.S. EPA's weight-of-evidence

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

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6 (a) (Continued)		characterization, naphthalene is designated as a possible human carcinogen, whereas data for 2-methylnaphthalene are inadequate to assess human carcinogenic potential. Thus, the total carcinogenic risk estimates that include 2-methylnaphthalene may be overestimated. For acetophenone, the hazard estimates based on the PRG for its surrogate compound, benzaldehyde, are similar to what would be expected for acetophenone, given that these two compounds are structurally similar and have the same oral reference dose (1 × 10-1 mg/kg day). For the other three COPCs evaluated using noncarcinogenic surrogate compounds, the estimated hazard may be over- or underestimated depending on the specific toxicity characteristics of these compounds. Several of the COPCs selected for groundwater (2-methylnaphthalene, 4-chloro-3-methylphenol, acetophenone, and phenanthrene) do not have U.S. EPA Region 9 PRGs. Estimates of risk and hazard for these compounds were instead based on PRGs of surrogate compounds recommended by DTSC. 2-Methylnaphthalene was the only COPC evaluated as a carcinogen based on its structural similarity to naphthalene. Based on U.S. EPA's weight-of-evidence characterization, naphthalene is designated as a possible human carcinogen, whereas data for 2-methylnaphthalene are inadequate to assess human carcinogenic potential; thus, the total carcinogenic risk estimates that include 2-methylnaphthalene may be overestimated. For acetophenone, the hazard estimates based on the PRG for its surrogate compound, benzaldehyde, are similar to what would be expected for acetophenone, given that these two compounds are structurally similar and have the same oral reference dose (1 × 10-1 mg/kg day). For the other two COPCs evaluated using noncarcinogenic surrogate compounds, the estimated hazard may be over- or underestimated depending on the specific toxicity characteristics of these compounds.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

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6 (b)	Lead: In addition to the well studied non-carcinogenic effects of lead on humans, the Department of Health and Human Services identifies lead acetate and lead phosphate as "*may reasonably be expected to be capable of causing cancer*" based on animal studies (ATSDR, internet). Therefore, we disagree with the report that lead is only a non-carcinogen (Section 5.5, 5th paragraph, page 5). Instead, we recommend the Navy to summarize the carcinogenic and non-carcinogenic effects of lead in the uncertainty discussion section.	It is agreed that exposure to lead acetate and lead phosphate has been documented as being associated with development of cancer. However, for the purposes of this preliminary assessment whereby concentrations were directly being compared to risk-based values or standards derived for a particular endpoint (e.g., carcinogenic or noncarcinogenic) the focus of the uncertainty was placed on that particular endpoint. Therefore, the uncertainty statement was a reflection of the particular comparison procedure used in the PA/SI and not meant to imply that lead is only a noncarcinogen. Please refer to the response to comment 4(c) provided by Patty Wong-Yim, Ph.D on page 8 for a summary of the updated HHRA uncertainty discussion related to lead.
6 (c)	Complete Exposure Pathways: As stated above, we consider inhalation of VOCs in ambient air and indoor air are complete exposure pathways under the residential exposure scenario. We understand that 6 to 9 feet of fill materials will be placed on top of the site during the wetlands construction. Consequently, we expect that the wetlands construction will reduce the inhalation risk, but will not completely eliminate these inhalation pathways. Therefore, we disagree that all the exposure pathways considered in the HHRA will become incomplete after the wetlands construction (last paragraph of page 42). Please amend. Also, HERD does not allow the risk assessments to include the projected effects of remediation yet to be accomplished. Such calculation may be acceptable later in the process when examining potential remedial options.	The uncertainty relating to the presence of 6-9 feet of fill has been removed from the text.
7	**Recommendations**: Based on a site-wide residential soil risk of 1.6E-6, a groundwater risk of 1.3E-2, and a groundwater hazard of 14, all of which are above the point of departure for HHRA, HERD cannot support a no further action recommendation on soil and groundwater at the site. Also, despite the presence of VOCs in soil and groundwater, the HHRA does not include an indoor air risk evaluation. We urge that the Navy revises the HHRA to include the appropriate indoor air risk estimation and a risk evaluation under the construction worker scenario. In addition, we advise consulting the RWQCB on potential uses of groundwater underneath the site and mechanisms to minimize direct human contacts with the groundwater.	Based on the current and planned future use of the property, and the fact that CCC will not dredge the PDD or conduct any earthmoving activities on the site as described in the response to general comment number 1 provided by Ms. Patty Wong-Yim, Ph.D. on page 2, the Navy does not view evaluation of the construction worker scenario as being necessary. The human health risk/hazard calculations have been updated by including PRGs of surrogate compounds for COPCs lacking PRGs and separation of dioxin-like and nondioxin-like PCBs as summarized previously in these responses to comments. The total site wide soil risk and hazard (for direct contact) remain at 1.6×10^{-6} and 0.2, respectively. Indoor air risks/hazards from VOCs in soil and groundwater have also been calculated for a hypothetical receptor. The estimated total risk and hazard index from indoor air is 3.9×10^{-6} and 0.1, respectively. Groundwater risk and hazard have been revised and remain at 1.3×10^{-2} and 14, respectively. As stated previously in

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		these responses to comments, the Navy will work with the regulatory agencies to ensure appropriate controls such as deed restrictions are in place to prevent the consumption of groundwater at the site if it is found to be necessary by the BCT members. However, given that total dissolved solids are too high for the groundwater to be considered a drinking water source (as agreed to by the RWQCB), additional controls do not seem to be warranted (please see response to Mr. Laurent Meillier's comment 3 on page 30). Based on the analytical data obtained for this site in conjunction with the uncertainties associated with the indoor air pathway, the Navy believes that the vapor intrusion to indoor air exposure is not a significant potential exposure and does not significantly affect the results of the risk assessment. Furthermore, based on the conservative nature and associated uncertainties of this screening-level risk assessment, the Navy believes that a "no further action" for human health is appropriate.
Specific Comments from Patty Wong-Yim, Ph.D., Human and Ecological Risk Division (HERD)		
1	**Comparison between Historical Data and PA/SI Data, Section 4.4, Last Paragraph, Page 31**: The paragraph compares previous site investigation data to the most recent PA/SI data. However, it is unclear which data represent the historical data and which data represent the most recent data, e.g. lead concentrations of 230 mg/kg *vs*. 12 mg/kg. Please clarify.	The paragraph has been revised to clarify which data was collected during historical sampling activities versus PA/SI sampling activities.
2	**Cal-Modified PRGs, Section 5.3, 3rd Paragraph, Page 37**: HERD disagrees with the statement that the Cal-Modified PRGs are nonstandard PRGs. The USEPA Region IX Office develops Cal-Modified PRGs for certain chemicals with Cal/EPA-derived toxicity criteria significantly different from the USEPA values (USEPA, 2004). It is our policy that whenever available, the Cal-Modified PRGs should be used in place of the USEPA Region IX PRGs, in screening risk assessments (DTSC, 1994a). We recommend deletion of the statement.	The statement has been deleted.

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3	**No Significant Threat to Human Health, Section 7.1.1, 1st Paragraph, Page 68**: The proposed future site use is wetlands. We understand that the hypothetical residents may not be the most appropriate human receptor for the property. However, based the HHRA results (a site-wide residential cumulative risk of 1.3E-2 and HI of 14.2), we cannot concur with a conclusion of no significant threat to human health. We recommend the Navy provide the further risk evaluations recommended above to support this statement.	The Navy has revised the residential risk evaluations as requested by DTSC HERD (e.g., evaluate all organic chemicals that do not have PRGs using surrogates, evaluate PCBs using TEQ approach, etc.) and also has included a hypothetical residential indoor air exposure to VOCs in soil and groundwater. Groundwater beneath the property is not currently used as a potable source, and as stated earlier, the RWQCB agrees that the groundwater does meet the total dissolved solids requirements to be considered a potential source of drinking water. In the event that BCT members find it necessary to prevent the consumption of groundwater by mechanisms such as deed restrictions, the Navy will work with the regulatory agencies to ensure such controls are in place; however, given that total dissolved solids are too high for the groundwater to be considered a drinking water source (as agreed to by the RWQCB), additional controls do not seem to be warranted (please see response to Mr. Meillier's comment 3 on page 30). In any event, with the groundwater consumption pathway not being an applicable exposure pathway, the total site carcinogenic risk estimated for COPCs in soil and indoor air for a hypothetical residential receptor is on the order of 10^{-6}, and the hazard index is less than 1.0. Considering these risk and hazard results apply to a hypothetical residential receptor, it can be concluded that no significant threat is posed to the more appropriate and less conservative recreational receptor. The revised site-wide risk and hazard have not been significantly impacted by revisions that have been made to address the requests from DTSC HERD, thus the Navy continues to support that there is no significant threat to human health at the Ballfields Parcels.
4	**Data Qualifiers, Appendix C**: A "J" qualifier is used to note an estimated concentration that is less than a method reporting limit, but greater than or equal to a method detection limit. According to the USEPA risk assessment guidance (USEPA, 1989), these data should be included in the HHRA. On the other hand, a "<" qualifier is used to identified non-detected chemicals and these data were not included in the HHRA. HERD concurs with the above data selections. However, a few data were qualified as "<concentration J" (e.g. bromomethane in R1-SB01: <0.9J, Table C-4). These data were not included in the risk calculation. It is unclear whether these data are estimated concentrations or non-detected. Please clarify and specific whether these data are acceptable for HHRA purposes.	The data validation company defines the "<" before the numerical result to indicate that the analyte was analyzed for but not detected, while the "J" after the numerical result indicates the sample detection limit is an estimated value. The sample detection limit was qualified as estimated (i.e., "J") by the data validation company because of a deviation from the specified laboratory protocol (e.g., ICP interference check as with molybdenum) or technical validation criteria (e.g., percent relative standard deviations outside parameter range). Therefore, because the analyte was not detected in the sample, it was not considered a COPC and was not included in the HHRA.

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	General Comments from Beckye Stanton, Ph.D., Office of Spill Prevention and Response, Department of Fish and Game	
1	The main airfield parcel Record of Decision (ROD) requires that all Inboard locations with concentrations of chemicals above the action goal be maintained in perpetuity beneath three feet of stable cover. This requirement is not equivalent to "no further action" or unrestricted use as foundation material. Material brought onto the site must meet the wetland cover criteria and the limits set in the U.S. Fish and Wildlife Service's 2003 Biological Opinion. Therefore, the assumption that soil contaminated with dichlorodiphenyltrichloroethane (DDT) and its metabolites (total DDTs) can be left in place as a no further action (NFA) ROD is inconsistent with both the remedy for the main airfield parcel and the restriction on imported dredge material. (a) The statements regarding DDT-contaminated soil from the main airfield parcel being "used as foundation fill material in the designed seasonal wetland" should be replaced with "required a remedy of three feet of stable cover maintained in perpetuity" in all instances.	The Navy has removed reference to on-site soils having DDT concentrations that are in the range of foundation fill material being used in the seasonal wetlands design of the HAAF wetlands restoration project.
2	In the ecological risk assessment (ERA), based on maximum concentrations detected in Navy Ballfields site-wide, the low toxicity reference value (TRV) based hazard quotients (HQs) exceeded one for metals, total DDT, and dinitrotoluene (2,6-DNT). In addition, high melting explosive (HMX), polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) were not included, but should be evaluated due to the bioaccumulative properties and presence of available toxicity information. Therefore, DFGOSPR does not concur with a NFA determination, and instead supports further evaluation, additional sampling, and possible hotspot removal. (a) Each chemical that has a low TRV-based HQ greater than one should be evaluated in a baseline (B) ERA. The BERA should use the 95th upper confidence limit (UCL) of the mean as the exposure point concentrations (EPCs) for each area of potential concern (AOPC). (b) Additional sampling to address lead contamination at Revetments 3, 4, and Revetment Spoils Pile and total DDT contamination in Spoils Pile N and along the perimeter drainage ditch (PDD) is needed to determine the extent of contamination and whether hotspot removals may be needed.	The COPC screening process described in the work plan for this project did indicate that all bioaccumulative compounds would be carried into the Phase 1 Predictive Assessment, however, benchmark values for PAHs and PCBs were identified at a later date that accounted for potential bioaccumulation and were derived using a food chain model. (See response to specific comment 14 from Beckye Stanton, Ph.D. on page 22). These benchmarks are appropriate for screening the potential bioaccumulative compounds of PCBs and PAHs and further evaluation in the dose assessment was determined not to be necessary. The text has been revised to further describe the bioaccumulative benchmarks and their application in the assessment. In response to the recommendations stated in item *a*), the Navy welcomes the opportunity to further revise the Phase 1 Predictive Risk Assessment, prior to determining whether preparation of a BERA or further data collection is warranted. The Navy has reassessed contaminant exposures to ecological receptors using the 95th UCL. The dose models for the Site-wide evaluation were recalculated using either the 95th UCL or the maximum soil concentration, whichever was lower. To further support a more site-specific dose assessment, a lead TRV of 1.6 mg dw/kg bw/day (Eco-SSL, U.S. EPA 2005) for avian receptors is proposed and

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		also has been included in the revised calculations. The HQs resulting from the reassessment are provided in the revised Table I-1 in Attachment 2. In addition to revising the chemical concentrations, the Navy recommends using a revised TRV for lead. When developing the avian TRV for lead, the Navy/BTAG TRV workgroup reviewed a number of different studies. Toxicity values for the avian TRV ranged from 0.014 to 26 mg/kg bw-day (HERD EcoNote 4, 2000), but the Navy/BTAG TRV for lead was chosen to be 0.014 mg/kg bw-day. This TRV is based on exposure to lead acetate, an extremely bioavailable form of lead. The Navy/BTAG TRV for lead is significantly lower than other widely accepted TRVs such as those from Oak Ridge National Laboratory (Sample et al., 1996) (i.e., 1.13 mg/kg bw-day based on lead acetate) or the U.S. EPA (2005) (i.e., 1.6 mg/kg bw-day). The U.S. EPA TRV for lead was developed following an extensive literature search and graphical plotting of various toxicity data (most of which were for lead acetate), from which the TRV was selected as the highest bounded NOAEL, lower than the lowest bounded LOAEL for reproduction, growth, or survival. General concerns about the Navy/BTAG TRV (DON, 1998) for birds make it difficult to adequately assess the risk from lead at the Ballfields Parcels and present a large amount of uncertainty with respect to interpreting the HQs. For example, using the U.S. EPA lead TRV for birds (1.6 mg/kg bw-day) to assess effects from lead to avian receptors at the Ballfields Parcels, significantly reduces potential risk (see attached Table I-1). The Navy has also included an assessment of HMX as recommended by the reviewer. The TRV was developed for mammals by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) (see response to specific comment 16 from Beckye Stanton, Ph.D. on page 23). The Uncertainty Analysis will also be expanded to address the application of low and high HQs. This analysis will focus on the magnitude of difference between the low TRVs, which represent a no effect level and the high TRVs which represent a mid-range effect level. This analysis will further assist in the interpretation of the risk

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		characterization where HQs_{low} exceed 1.0 but the corresponding HQs_{high} are well below 1.0. In response to item *b*), the Navy believes that the revisions to the Phase I Predictive Assessment presented above will better determine whether additional soil sampling or hotspot removal is warranted. Therefore, the Navy recommends revising the ecological risk assessment to include the revisions presented above to assess the need for further sampling and the need for remedial actions.
3	On Table H-1, the total DDT soil concentration (0.04 mg/kg) used in the soil to small mammal conversion is incorrect and should be revised to 0.36 mg/kg. The resulting small mammal concentration should be 5.5 mg/kg (not 1.23 mg/kg) on Table 1-1. As a result, the dose model calculations for Burrowing Owl and Northern Harrier will need to be revised. All associated tables and text should be revised accordingly.	Table H-1 was reviewed to confirm that all equations and parameter values are correct. As indicated in Table 17 of the Draft PA/SI document (which is also provided in Attachment 2 to these responses to comments), a regression equation obtained from U.S. EPA, 2005 was used to estimate the tissue concentration in a herbivorous small mammal (e.g., California vole) based on concentration in its diet, which was estimated using the soil to plant uptake factor. The majority of the other regression equations used to estimate small mammal prey tissue concentrations were derived from Sample et al., 1998 (see Table 17); these models were based on empirical relationships between small mammal tissue and surface soil concentrations. Thus, for these models the independent term is the soil concentration, not the estimated plant tissue concentration as in the case of the U.S. EPA model. The uptake of DDT to small mammal is based on the following regression equation from U.S. EPA (2005): $Ln(C_m) = 0.663*\ln(C_d) + 2.3833$ where: C_m = DDT concentration in mammal C_d = DDT concentration in diet (mg/kg dw) For the California vole, the small mammal concentrations (C_m) were based on a herbivorous diet. As such, C_d is the concentration of DDT in plants, which is footnoted at the bottom of Table 17 (see Attachment 2). Note that Table H-1 in Attachment 2 has been revised based on the recommendation to use a 95^{th} UCL exposure concentration.

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4	It would be helpful to include distribution maps of analytical results by chemical, at a minimum for chemicals that exceed low TRV HQ of one in the ERA.	Chemical distribution maps for those chemicals resulting in an HQlow greater than 1 in the Phase 1 Ecological Risk Assessment have been included in the revised report.
Specific Comments from Beckye Stanton, Ph.D., Office of Spill Prevention and Response, Department of Fish and Game		
1	Page viii. The statement regarding PCBs results, "and were therefore deemed not a concern," should be revised to "and therefore did not warrant further sampling."	The sentence has been revised as requested.
2	Page xi, Table ES-1. It appears that not all results are presented for the three ranges (<1, 1-10, >10) of hazard quotient (HQ) based on the TRV. For example, the revetment spoil pile soil samples were analyzed for semi-volatile organic compounds (SVOCs), metals, and total DDTs, but only thallium, cadmium, and selenium are listed for the California vole. Please revise the table to include all the analytes listed for the three different categories.	Table ES-1 summarizes the results of the Phase I Predictive Assessment described in Section 6.2, which evaluated only those COPECs identified through the screening process for which sufficient toxicity data exist. Samples collected from the revetment spoils pile (RSP) were analyzed for three different chemical classes, however, not all analytes detected were evaluated in the dose assessment because they were screened out in the SLERA or sufficient data did not exist to evaluate the analyte in the dose assessment; therefore, not all of these analytes are shown on Table ES-1. For example, the maximum total DDT concentration in the RSP is 0.0014 mg/kg, which is less than the screening benchmark of 0.0035 mg/kg; therefore total DDT was not a COPEC included in the dose assessment for RSP and was therefore not included on Table ES-1 for the California vole.
3	Page 3, Section 2.2. Please replace the text "are currently unused and overgrown with weeds" with "ar~ currently unused by the Navy, but provide upland and seasonal wetland habitat for wildlife."	In the absence of a wetland delineation study to formally identify the potential wetland habitat, the Navy agrees to revise the text as follows: “are currently unused by the Navy, but provide upland habitat and potentially limited seasonal wetland habitat for wildlife.”
4	Page 6, Section 2.3.4. Please include the ROD requirement for three feet of stable cover over contaminated soil that is being managed on-site.	The requested change has been made.
5	Page 6, Section 2.3.4. Total DDTs concentrations greater than 1 mg/kg were detected in the unlined portion of the PDD, Building 35/39, and in the runway area. In addition, the Army Corps has completed additional sampling around the runway DDT hotspot and discovered a relatively large area contaminated with total DDTs at concentrations greater than 1 mg/kg. Therefore, please revise the phrase, "one had total concentrations of Total DDT above 1 mg/kg" to represent more accurately the currently known extent of Total DDT contamination.	The Navy has made a request to Army BRAC for an updated summary of the DDT analytical results greater than 1 mg/kg on the airfield, and will include an updated discussion in the revised report.
6	Pages 18 and 19, Section 4.1.1. Photo ionization detectors (PID) detect only VOCs; therefore, the word "volatile" should be added in both instances.	The sentence has been revised accordingly.
7	Pages 31 to 32, Section 4.4. The historical and new sample results should be clearly identified in the comparisons (e.g., revise "230 mg/kg vs. 12 mg/kg").	The text has been revised accordingly.

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8	Page 34, Figure 9. Surface water ingestion should be included as a complete pathway for terrestrial ecological receptors. If surface water is not included, this should be considered as a potential underestimation in the uncertainty section (Section 6.3).	As discussed in the PA/SI (Section 5.2 and Section 6.1.2) the PDD is the only area at the site having a potential surface water feature. The source of this water is from a permitted storm water pumping station operated by the City of Novato and may result in temporary or episodic pooling of water following rainfall events. As such, surface exposure is considered a minor pathway. In addition, based on previous discussions with the regulatory agencies involved, an agreed consensus was formed that evaluation of the PDD (other than the top of the banks), and any potential human and ecological receptors therein, did not need to be evaluated. The main reasons for this decision included: 1) the majority of the water flow comes from a permitted stormwater discharge facility operated by the City of Novato, and 2) all sediments and vegetation were removed down to the concrete lining in 1998; therefore, any impacts to the PDD that were a result of historical site activities would have been primarily addressed by the 1998 removal action and no additional evaluation is necessary. The Navy has revised Figure 9, the Conceptual Site Model, to reflect surface water ingestion as a minor pathway. Although this pathway is not quantitatively evaluated in the dose assessment models, a discussion has been provided in the uncertainty analysis (Section 6.3) as recommended.
9	Page 46, Section 6.1. The description of the vegetation community should include the vegetation growing in and along the PDD, such as cattails.	The description of the vegetation community has been revised accordingly.

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10	10. Page 47, Section 6.1.2. The potential inhalation exposure to burrowing animals should also be discussed.	A total of 53 VOCs were analyzed in a total of 32 soil samples collected during the PA/SI sampling activities. Acetone was detected in 3 of 32 samples, 2 of which were "J" qualified, meaning the result is an estimate between the method detection limit (MDL) and the method reporting limit (MRL). M,p- xylenes, o-xylene, and methylene chloride were detected in only 1 sample out of 32, again, each qualified with a "J". Because of the frequency of VOC detections was low and the detected concentrations were extremely low (i.e., nearly all "J" qualified), the inhalation pathway for burrowing animals was considered to present *de minimus* risk to terrestrial receptors at the Ballfields Parcels. Available inhalation toxicity data supports this conclusion. Based on the U.S. EPA RAGs volatilization criterion (i.e., Henry's Law constant $< 1 \times 10\text{-}5$ atm-m^3/mol), only the VOCs mentioned above could pose a potential inhalation hazard to burrowing animals including the ground-nesting Burrowing Owl. It is assumed that the vegetated ground surface throughout the site would preclude a significant soil particulate exposure to the general ecological receptor. Estimated soil gas concentrations were derived for the four VOCs detected in soil (see Table 1 in Attachment 2) using U.S. EPA's Johnson & Ettinger spreadsheet and compared to NOAEL threshold effect concentrations. In all cases, the maximum soil gas concentrations are well over an order of magnitude lower than the conservatively-derived NOAEL TECs (Table 1 in Attachment 2) indicating that VOCs in soil do not pose a substantial hazard to burrowing animals at the site. In addition, these VOCs were not detected in site groundwater samples, there were no PID readings above background levels detected during collection of subsurface samples, and all four detected VOCs are routinely identified as laboratory contaminants. Consequently, this exposure route was eliminated from further consideration.
11	Page 47, Section 6.1.2. Inputs to storm water drains in the adjacent housing areas are likely a year-round source of surface water in the PDD. In addition, severe storms can result in water ponding on the ground surface, in addition to filling the PDD. State personnel have observed this flooding during previous site visits.	The second sentence of the fourth paragraph in Section 6.1.2 been revised to read, "However, standing water may occur periodically on the Ballfields Parcels and in the PDD as a result of severe storms, which has been observed by Navy and State personnel during a site walk that followed a record rainfall event that occurred on February 24, 2004."

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12	Page 48, Section 6.1.2. The statement "any sediment currently present in the PDD is not associated with historical military activities" should be revised or removed. Historical military activities have resulted in contamination of soil, sediment, and surface water that may still be entering the PDD in the years since the 1998 dredging.	The sentence has been revised to read as follows: All sediments were removed down to the concrete lining of the PDD in 1998 (IT, 2000); therefore, it is unlikely that all of the sediment that has collected along the bottom of the PDD since 1998 is associated with historical military activities that ceased in 1974. Rather, the majority of sediment present in the PDD today is most likely associated with the City of Novato permitted storm water discharge outfall.
13	Page 48, Section 6.1.3. DFG-OSPR supports the protection of both individuals and populations as required by Fish and Game Code Section 3005. In addition, the protection of an individual of a species from the toxic effects of a chemical contaminant(s) is protective of the population. Apart from plants, invertebrates, and perhaps fish, we know of no acceptable adverse effects level or criterion that is unequivocally protective of mammal and bird populations. Therefore, protection of the individual, as implied by use of the no adverse effect TRV, is the most protective or conservative means of assuring animal populations are not adversely affected by chemical contaminants. Please remove this distinction by replacing "sustain populations of..." with "sustain" for each assessment endpoint.	The Navy agrees that protection of individual receptors will tend to provide the most protective and conservative means of evaluating potential hazards to ecological resources. The conservatism inferred by this approach is entirely appropriate for a screening level assessment where the risk of committing Type I errors is to be minimized. It is also acknowledged that many of the measures of effect available to evaluate baseline risks are based on individual response data. However, it is important that the distinction between the assessment objectives and the tools available to meet those objectives are maintained throughout the process. For most ecological receptors, management objectives most closely approximate ecological receptor units defined at the population- or community-level. Of course, where endangered species or other species of special concern are involved, what happens at the individual organism level has potential consequences and it is necessary to narrowly define the receptor unit of interest. Looking beyond the conservative assumptions necessary in the Phase I Predictive Assessment, further analysis of potential ecological risks at the Ballfields Parcels should focus on assessing more realistic exposures and better defining important assessment endpoints so that informed management decision making can be best facilitated. In this context, focus on ecological populations and communities, as the basis for assessment objectives, is most appropriate for all but special concern species. The Navy recommends no change to the text.

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14	Page 51, Section 6.1.4. In the Navy's response to comments (RTCs, comment number 29) on the Draft Final version of the PA/SI work plan, the Navy agreed to include all bioaccumulative compounds in the screening level (SL) ERA food chain modeling. However, several bioaccumulative chemicals including total PCBs and PAHs were not retained because they did not exceed their respective benchmarks. These chemical classes should be evaluated in the SLERA as previously agreed to.	The Navy did agree to carry all bioaccumulative compounds into the Phase I Predictive Assessment. Typically, screening-level benchmarks only assess toxicity endpoints and often are not protective of the bioaccumulation hazard. However, in the process of evaluating toxicity threshold values, screening benchmark values for PAHs and PCBs were identified that accounted for potential bioaccumulation. These benchmarks were developed to screen bioaccumulative chemicals such as PAHs and PCBs and were derived using a food chain model. The benchmark for PCBs (0.371 ppm) is an ecological PRG from ORNL (Efroymson et al., 1997) designed to be protective of the shrew. This PRG was "derived by iteratively calculating exposure estimates using different soil concentrations and soil-to-biota contaminant uptake models…for small mammals. [Values] were obtained from Sample et al. 1997 *Development and Validation of Bioaccumulation Models for Small Mammals*….For each chemical, the PRG for each of the wildlife species was compared, and the lowest value was selected as the final wildlife PRG…For most chemicals the final PRG was based on the PRG for either a shrew or American woodcock….due to the large quantity of soil ingested by these wildlife and the relatively high chemical uptake rates for their food (earthworms)." For PAHs, mammalian benchmarks were obtained from U.S. EPA Region 5 (2003 updated) *Ecological Screening Levels for RCRA Appendix IV Hazardous Constituents.* "Mammalian soil ESLs [ecological screening levels] were developed with a simple three-step ingestion and accumulation model. The model is based on exposure to either a small herbivore or to a small carnivore (that is, from soil to plant to receptor for the herbivore, or from soil to prey species to receptor for the carnivore)." The Navy therefore believes that the use of benchmarks specifically derived to account for bioaccumulation through the food chain is appropriate in the SLERA to screen potential COPECs. The text has been revised to clarify that screening of PAHs and PCBs has been conducted using benchmark values designed to account for bioaccumulation.

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15	15. Page 51, Section 6.1.4. Any chemical retained as a chemical of potential environmental concern (COPEC) should be evaluated for all the receptors of concern. For example, cobalt exposure should be evaluated for birds, mammals, and invertebrates, in addition to plants.	The maximum concentration of cobalt exceeds only the screening benchmark protective of plants (13 mg/kg) and is well below the screening benchmark for birds (120 mg/kg). In fact, if the 95th UCL for cobalt (14 mg/kg) is considered, then the soil concentration is only slightly above the benchmark for plants (13 mg/kg) and significantly lower than the benchmarks for invertebrates (1,000 mg/kg), mammals (240 mg/kg), and birds (120 mg/kg). Given these results, it does not seem necessary to evaluate cobalt for those receptor groups where concentrations did not exceed applicable screening benchmarks.
16	Page 52, Table 15 and Page 54, Section 6.2. The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined mammalian TRVs for HMX (http://chppm-www.apgea.army.mil/erawg/tox/HMX(FINAL).pdf). Therefore, HMX should not be eliminated from further quantitative analysis.	The Phase I Predictive Assessment has been revised to include HMX using the TRV established by the U.S. Army Center for Health Promotion and Preventive Medicine. The resulting HQs_{low} for the mammals ranged from 0.15 to 2.1 based on a soil concentration of 0.69 mg/kg (refer to Table I-1 in Attachment 2).
17	Page 56, Table 17 and Appendix H, Table H-1. The derived soil-to-terrestrial invertebrate bioaccumulation factors (BAFs) for thallium (http://el.erdc.usace.army.mil/arams/pdfs/usachppm.pdf, Page 4-18) can be used instead of an assumption of equivalency with soil concentrations. Using the maximum BAF for the five *different* orders of invertebrates, tissue concentration equals 0.263 times the concentration in soil in dry weight units. (a) The use of footnote (b), "assumed to be negligible," appears to be excessive as it is applied to all small mammal uptake factors. This footnote should be revised or additional justification included for why it applies to all small mammal uptake factors. (b) As mentioned above, please add cobalt to these tables.	The derived soil-to-terrestrial invertebrate concentration for thallium has been revised using Cs × 0.263 as requested. Applying this factor to the 95th UCL results in a worm concentration (C_{worm}) of 0.03 mg/kg dry weight (refer to Table H-1 in Attachment 2). (a) The reference was intended to read 1998b and not 1998$^{(b)}$; it was incorrectly presented as a footnote and has been corrected. Footnote (b) only applies to those compounds where the concentration was reported to be zero. The tables will be revised accordingly. To avoid further confusion, the footnote will be associated with the numeric value and not the literature reference. Please refer to revised Table H-1 in Attachment 2. (b) Please see response to specific comment 15 from Beckye Stanton, Ph. D. regarding cobalt on page 23.
18	Page 59, Section 6.2.2. The description of the high TRV as being consistent with a lowest observable adverse effect level (LOAEL) is generally incorrect. This statement is also changed from the text used in the work plan of "approximately mid-range of all of the reported adverse effects." Please replace the use of LOAEL in this and any subsequent occurrences with "mid–range adverse effect level"	The text has been revised as requested.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
19	Page 59, Table 18. The TRVs for HMX and PCBs should be added here.	The mammalian TRVs for HMX obtained from the USACHPPM have been added to Table 18; however, TRVs for PCBs have not been added for reasons provided in response to general comment 2 from Beckye Stanton, Ph.D, on page 15.
20	Page 60, Section 6.2.3. As mentioned above, the high TRV is not generally based on a LOAEL, therefore the following statement is incorrect and should be removed: "further evaluation may be considered but is not absolutely necessary because the dose is less than the high TRV which means no statistically significant adverse effect has been documented."	The sentence has been revised as follows: When the dose exceeds the low TRV (i.e., HQ_{low} >1) and is less than the high TRV (HQ_{high} <1) in a Phase I predictive assessment, further evaluation should be considered but may not be absolutely necessary because these results fall within an area of great interpretive uncertainty. Therefore, the magnitude of the HQs, the level of confidence assigned to the TRV, and the degree of conservatism employed in deriving the exposure dose estimates need to be considered when determining whether further evaluation is warranted.
21	Page 62, Section 6.2.3.1 and Page 69, Section 7.1.2. Adverse effects to plants or other organisms can also result in reduced success of more sensitive species and selection of resistant species. This impact should be mentioned in the potential explanations for the biological observations.	Sections 6.2.3.1 and 7.1.2 have been revised to include the potential impact.
22	Page 65, Table 21. The footnotes appear to be used inconsistently and should be revised appropriately. In addition, it is unclear whether "background threshold concentration" refers to the main airfield ambient soil ("background") or a toxicity benchmark ("threshold").	The footnotes have been revised as appropriate. Background threshold concentration refers to the BRAC ambient soil data, not a toxicity benchmark. The column has been renamed to "Background Soil Concentration." The "Source" column refers to the source of the plant benchmarks and has been moved to the right of the "Plant Benchmark" column.
23	Page 66, Section 6.3. Animals could limit their foraging to areas "impacted by historical activities at HAAF." Presumably, this statement is meant to refer to the Navy Ballfields parcel only, but is incorrect as a general statement inclusive of any site at Hamilton that the military used historically.	The statement currently reads, "….individual receptors could be exposed to soil contamination at the Ballfields Parcels; however, they would also forage in the other areas <u>not</u> impacted by historical activities at HAAF." The intent of the statement is to suggest that the receptor is assumed to only forage in the impacted area of the Ballfields Parcels, when in fact, the receptor may be just as likely to forage in areas that have not been impacted by historical activities. The statement was offered as a general statement about the degree of conservatism employed in the assessment rather than to suggest that an animal could only be exposed to contaminants associated with historical activities at the Ballfields Parcels.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
24	Page 66, Section 6.3. As part of the SLERA, conservative assumptions, such as 100 percent site use and maximum concentrations, are made to balance the lack of complete site characterization and site-specific inputs. This practice also reduces the likelihood of a false negative error.	Comment acknowledged.
25	Page 66, Section 6.3. The availability of screening benchmarks (as soil concentrations in mg/kg) for soil should be considered separately from that of TRVs (as daily dose relative to body weight in mg/kg-d) since they are calculated and applied differently.	The second sentence of the paragraph discussing the lack of available screening benchmarks (Section 6.3., page 66) is referring to the lack of soil screening benchmarks (as soil concentrations in mg/kg) that are protective of bioaccumulation hazards to wildlife and used during the COPEC screen. However, TRVs for these COPECs also were not available. The text has been revised to separately address the uncertainties associated with the lack of screening benchmarks and TRVs.
26	Page 68, Section 7.1.2. The process of eliminating or retaining chemicals should be clearly identified. For example, chemicals were screened against background (inorganics only) and ecological benchmarks, and only those chemicals that exceeded these values were evaluated in the food-chain model.	The text in Section 7.1.2 has been modified to indicate that only those chemicals exceeding ambient background concentrations or ecological benchmarks were evaluated in the food-chain model.
27	Page 68, Section 7.1.2. All chemicals with HQ greater than one with the low TRV should be listed since the use of HQ of 10 with the low TRV as a threshold for further action is not appropriate. As mentioned above, all chemicals with HQ greater than one with low TRV should be evaluated in a BERA.	Section 7.1.2 is intended to be a summary of the conclusions and recommendations. Table 19 and Appendix I provide a more complete list of the resulting HQs. Please see response to general comment 2 provided by Beckye Stanton, Ph.D. on page 15 regarding carrying all chemicals with HQ_{low} greater than one into a BERA.
28	Page 68, Section 7.1.2. The comparison between risk from background and site-related concentrations for inorganics should be in the context of all chemicals retained that were higher than background.	The text has been revised to include all COPECs with regard to comparison of site-related and background risks.
29	Page 69, Section 7.1.2. Complete cover and the lack of visibly stressed vegetation do not negate the potential for adverse impacts to plants such as reduced growth or selection for resistant species.	The Navy proposes the following revised text: "potential soil contamination has not resulted in gross impacts (i.e., loss of cover or visible signs of stress) to the vegetative community; however, no data are available to assess more sensitive measures of effect such as reduced growth or changes in community composition."
30	Page 69, Section 7.2. As stated above, DFG-OSPR supports further evaluation of potential ecological risk in a BERA, additional sampling for lead and total DDT contamination, and consideration of hotspot removals depending on the results of further sampling.	Please refer to the response to general comment number 2 provided by Beckye Stanton, Ph.D. on page 15.
31	Appendix C, Tables C-3 and C-4. It would be helpful to highlight (e.g., bold text or shaded cell) detected concentrations.	The requested change has been made.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
32	Appendix C, Table C-6. The results for total DDTs should also be presented, in addition to those for the six individual compounds.	Derivation of total DDT was provided in the main text of the PA/SI Report in Table 9. Total DDT was a calculated value and was not provided as a separate analytical parameter from the laboratory as was all other data included in Appendix C.
33	Appendix C, Table "C-7. The results for total PCBs should also be presented, in addition to those for the individual compounds.	Similar to total DDT, the derivation of total PCB was provided in the text in Table 6.
34	Appendix C, Table C-9. The caption should mention that groundwater samples were unfiltered and total metals were analyzed.	Table C-9 has been revised to include a footnote that indicates analyses are for total metals and the samples were not filtered.
35	Appendix F. Since this section only includes comparisons to human health benchmarks, its title and table headings should reference human health.	The appendix heading has been revised to read as "Appendix F. Summary of Chemical-Specific Human Health Risk/Hazard Estimates by AOPC and Site-Wide." An example of the revised table headings is "Table F-1. Summary of Human Health Risks and Hazards for COPCs in Soil Associated with Building 191."
36	Appendix H, Table H-1. The reference for each bioaccumulation model should be included in this table. In addition, the footnotes should specify that it is exponential (EXP) of the natural log, not log base 10.	Table H-1 from Appendix H has been revised as requested and is provided in Attachment 2 to these responses.
37	Appendix H, Table H-1. The total DDT soil concentration (0.04 mg/kg) used in the soil to small mammal conversion is incorrect and should be revised to 0.36 mg/kg.	Table H-1 in Appendix H has been reviewed and determined to be correct with regard to the total DDT soil concentration of 0.04 mg/kg as described in the response to general comment 3 from Beckye Stanton, Ph.D. on page 17.
38	Appendix I, Table 1-1. As mentioned above, the small mammal total DDT concentration and dose models for Northern Harrier and Burrowing Owl need to be revised. In addition, a footnote should be added that distinguishes the two evaluations for robin based on invertivorous and omnivorous diets. The TRVs and their sources should be included on the table.	As noted in the response above, the equation for total DDT is correct; please see response to general comment 3 from Beckye Stanton, Ph.D. on page 17 for details Table I-1 has been revised by adding a footnote as requested and is provided in Attachment 2.
39	Appendix K, Table- K-1. This table should include all information necessary to perform the calculation as in Table I-1 plus the TRVs.	This table has been revised as recommended and is provided in Attachment 2.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
General Comments from Denise M. Klimas, Office of Spill Prevention and Response, Department of Fish and Game		
1	The PA/SI recommends a finding of no further action for the Ballfields Parcel. The results of the screening ecological risk assessment do not support this finding. Hazard quotients for some contaminants are over 100. HERD recommends that a baseline risk assessment be conducted using the 95th upper confidence limit (UCL) on the mean as the exposure concentration rather than the maximum concentration.	The Phase I Predictive Assessment for the Site-wide evaluation has been refined using the 95th UCL on the mean or the maximum soil concentration, whichever was lower, to estimate exposure point concentrations. In addition, the lead TRV of 1.6 mg/dw/kg bw/day (Eco_SSL, U.S. EPA 2005) for avian receptors was used to enhance the Phase I Predictive Assessment. Updated HQs based on these refinements for the Site-wide evaluation are provided in Table I-1 in Attachment 2.
		As indicated on Table I-1 in the Attachment 2, all HQs_{high} remained below 1.0. HQs_{low} above 1.0 are indicated by shaded cells on Table I-1. COPECs with HQ_{slow} greater than 1.0 are cadmium, chromium, lead, mercury, selenium, zinc, HMX, total DDT, and 2,6-DNT. None of the HQ_{slow} are above 10, and in fact, the majority of the HQ_{slow} are less than 3.0. Note that exposure concentrations used for cadmium, chromium, mercury, and zinc are less than the background threshold values; thus site-related risk is less than background risk for these metals (see Table K-1 in the Attachment 2 HQs based on background threshold values). The HQ_{low} for 2,6-DNT is 1.0 and for HMX it is 2.2. HQ_{slow} for lead range between 1.0 and 2.1. The HQ_{low} for selenium is 2.0. For total DDT, the HQ_{slow} are between 3.8 and 7.0 using an exposure concentration of 0.12 mg/kg. The reasons for decreases in the HQ_slow compared to the Phase I assessment presented in the Draft PA/SI, are attributed to the use of the 95th UCL and the U.S. EPA Eco_SSL TRV for lead. In many cases, the 95th UCL exposure concentrations are considerably lower than the maximum concentrations used in the Draft PA/SI Report because spatial variability and frequency of detect is taken into account. Additional qualitative analysis will be performed for all COPECs with HQs_{low} greater than 1.0 and associated HQs_{high} less than 1.0 to better understand the inherent uncertainty included in the risk assessment. This analysis will include a more detailed examination of the dose-response relationship for these COPECs and an assessment of where the putative effect threshold falls relative to the TRV_{low} and TRV_{high} values. It is anticipated that the recommendation of No Further Action will be further supported by these analyses.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
2	HERD recommends that additional delineation sampling be conducted in the area around the Revetment Spoils Pile, and Revetments 3 and 4. These are the areas where elevated lead concentrations are located and hazard quotients were 306 and 150.	The Navy proposes to perform additional evaluation of the data prior to considering more sampling activities.
Specific Comments from Denise M. Klimas, Office of Spill Prevention and Response, Department of Fish and Game		
1	Executive Summary, page viii. The statement that PCBs are not a concern at the Ballfields Parcel because they are below human and ecological screening numbers is inconsistent with the previous agreement to evaluate bioaccumulative contaminants in the PA/SI. Please change this statement to reflect that PCBs will be evaluated in the ecological risk assessment.	Please see the response to specific comments 1 and 14 provided by Beckye Stanton, Ph.D. on pages 18 and 22, respectively.
2	Executive Summary, Table ES-1, page xi. Actual hazard quotients for the ecological risk evaluation results should be presented in this table rather than ranges of less than 1, between 1 and 10, and over 10.	The table is presented to summarize a large amount of information that is presented in multiple appendices of the PA/SI Report. The specific HQ of each receptor/pathway combination can be found in the respective appendix, but this level of detail would seem to be out of place if it were incorporated into Table ES-1 of the executive summary. The Navy proposes to leave the summary table ES-1 in its current format.
3	Section 6.1.4, COPEC Screening Process, page 51. Both organic and inorganic COPECs were eliminated from consideration in the ecological risk assessment based on a comparing the maximum detected concentration to the soil screening benchmarks. According to DTSC guidance, if a COPEC is detected it must be carried through the risk assessment. If the COPEC is not detected, and the detection limit is below the screening number, then the COPEC may be eliminated. Please retain all of the metals, PAHs, total PCBs and VOCs unless the data meet the DTSC criteria.	The COPECs evaluated in the Phase I Preliminary Assessment were identified using the screening process presented in the approved Work Plan, which the Navy continues to believe is consistent with the DTSC guidance. Specific guidance for conducting the scoping assessment (Part B of the *Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities*) provides a discussion on the process of COPEC identification based on comparison to established benchmarks and criteria and recommends that a justification be provided for inclusion or exclusion of all detected compounds. Further, all compounds that fail the screening process are carried into the Phase 1 Predictive Assessment. Further discussion regarding PAHs and PCBs is provided in response to specific comment 14 provided by Beckye Stanton, Ph.D. on page 22.
4	Table 5, Chemicals Detected in Groundwater, page 13. Groundwater data collected at the Ballfields Parcel indicate exceedances of the California Toxic Rule for either the fresh water criteria or the salt water criteria for the following constituents: arsenic, chromium, cadmium, copper, lead, mercury, nickel, and zinc. Although the groundwater was evaluated in the PA/SI based on exposure to humans, and existing exposure to ecological receptors, a future scenario where the shallow groundwater moves up and is in contact with the new dredged material was not considered. HERD is concerned that the shallow groundwater will surface into the new sediments	First, it must be noted that total metals analysis of groundwater samples was performed and no filtering in the field or laboratory was completed; therefore comparison to water quality criteria based on dissolved concentrations is not appropriate. Furthermore, CTR is applicable to inland surface waters, enclosed bays, and estuaries, not groundwater. A future scenario where the shallow groundwater moves up and is in contact with the new dredged material was not considered during the

Comment Number	Comment	Response
	as the existing soils become saturated. This scenario could provide the opportunity for ecological receptors utilizing the new marsh habitat to be in contact with the elevated concentrations in the groundwater. HERD recommends that a geologist evaluate the potential for existing groundwater to move up into the newly deposited dredge material in the proposed future use scenario.	PA/SI. The native soils present at the site are made up of Bay Mud, which is a very low permeability unit. Currently, the Ballfields Parcels are topographically higher than the Airfield. This will remain to be the case after the wetlands redevelopment project is complete because 7-9 feet of fill material will be brought into the Ballfields Parcels area to establish a seasonal wetland, while the Airfield will be at a lower grade and serve as a tidally influenced wetland. Given these development plans, the Navy is not aware of any mechanism that would result in a rise of groundwater levels in the future or a change of the current groundwater gradient from the Ballfields Parcels toward San Pablo Bay.
General Comments from Laurent M. Meillier, P.G., California Regional Water Quality Control Board		
1	The report states that the concentrations of contaminants currently identified in on-site soils qualify those soils as foundation fill material for a seasonal wetlands restoration. There are two concerns this statement raises: 1) the ecological risk assessment presented in the report addresses current risks not use as a future seasonal wetland and 2) in staff's opinion, qualifying the site as "foundation fill" would require placement of a cover, i.e., a remedy. This would require an early transfer approach such as was applied to the neighboring Army BRAC parcel.	The Navy has removed reference to on-site soils having DDT concentrations that are in the range of foundation fill material being used in the seasonal wetlands design of the HAAF wetlands restoration project. Please refer to the response to general comment 2 provided by Beckye Stanton, Ph.D. on page 15 for a summary of the changes that have been made to the ecological risk assessment.
2	Staff prefers that the Navy revisit the approach presented in the report to quantify current ecological risks at the site. While it is understood that the approach presented is a conservative one, (based on calculating risk using the maximum concentration of each chemical of potential ecological concern (COPC)), it does not take into consideration the spatial variation in contamination at the site. The risk estimates presented based on the high BTAG Toxicity Reference Values show no elevated hazard quotients. Risk estimates for cadmium, selenium, zinc, mercury, chromium, and copper based on the low Toxicity Reference Values are very similar to the risks calculated for background levels of these contaminants. Risk estimates based on a statistical analysis of the data would provide a better characterization of risk that takes into consideration the spatial variation of contamination at the site. We therefore recommend that a UCL95 of the mean be evaluated in the site-wide risk estimate rather than maximum values	The Navy has revised the ecological risk assessment by using the 95th UCL of the mean or the maximum concentration, which ever is lower, as the exposure concentration. Please refer to general comment 2 provided by Beckye Stanton, Ph.D., on page 15 for a detailed summary of revisions that have been made to the ecological risk assessment.

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
3	Groundwater was sampled and analyzed at the site as requested by regulators and resource trustees. Staff agrees with statements in the PA/SI that groundwater is not considered a potential source of drinking water. State Board Resolution 88-63 identifies total dissolved solids (TDS) greater than 3,000 mg/L as an exception to the policy designating groundwater as a source of drinking water. Data collected from wells on the adjacent BRAC parcels indicated elevated TDS.	Comment noted. Information provided in the ROD/RAP for the Main Airfield Parcel (2003) at Hamilton Army Airfield (HAAF)is as follows: "Groundwater beneath the Main Airfield Parcel and adjacent marsh is not now, nor is it likely to be, used for drinking water. State Water Resources Control Board (SWRCB) Policy 88-63 specifies that total dissolved solids (TDS) in excess of 3,000 milligrams per liter (mg/L) renders groundwater unsuitable for drinking. The TDS concentrations in groundwater from monitoring wells across the property range from 819 to 18,270 mg/L with an average TDS concentration of 4,898 mg/L (IT, 1999a). These findings indicate that groundwater beneath the Main Airfield Parcel and adjacent marsh is generally unsuitable for drinking because the average TDS concentration exceeds the 3,000 mg/L limit." SWRCB Resolution 88-63 applies to all sites that may be affected by discharges of waste to groundwater or surface water. The resolution specifies that, with certain exceptions, all groundwater and surface waters have beneficial use of municipal or domestic water supply. These exceptions include, among others, if: (1) the TDS exceed 3,000 mg/L or (2) the water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day. In the case of HAAF, both these exceptions apply; therefore, groundwater below the site was not considered suitable for municipal or domestic water supplies. Because groundwater was not considered a viable source for municipal or domestic water supplies, HAAF did not have to include a groundwater deed restriction in its "Covenant to Restrict Use of Property" (2003) available at DTSC's website (http://www.dtsc.ca.gov/database/Calsites/Deed_List_County.cfm)

Responses to Regulatory Comments on the Draft Preliminary Assessment/Site Investigation for Ballfields Parcels at Department of Defense Housing Facility, Novato, California dated August 24, 2005 (Continued)

Comment Number	Comment	Response
	Specific Comments from Laurent M. Meillier, P.G., California Regional Water Quality Control Board	
1	**Executive Summary:** Please explain the method used to calculate the total site-wide estimates of risk provided in Table ES-1 in the Executive Summary. Please remove the word "known" on page ix in reference to the effects levels based on high TRVs	The word "known" on page ix in reference to the effects levels based on high TRVs has been removed. The fifth paragraph of the executive summary has been revised as follows: "In order to determine if chemicals present in soil and groundwater pose a significant threat to human health or the environment, both human health screening-level and ecological risk evaluations were conducted for each of the AOPCs, as well as on a Site-wide basis. Screening-level risk evaluations for the AOPCs and Site-wide were conducted using the same methodology, but different data sets. For each AOPC, only the analytical data associated with samples collected from that AOPC were used, whereas for the Site-wide screening-level evaluation, data from all the AOPCs were combined. Results of the screening evaluations are summarized in Table ES-1 and are described below."
2	**Groundwater Data:** Please describe more completely the collection of the groundwater samples, including the purging process utilized prior to sampling of the wells.	A more detailed description of the groundwater sampling process has been provided in Section 4.0.
3	**Section 3.1, Hydrogeologic Setting, p 10:** Please refer to the San Francisco Basin Plan, and state that groundwater in Novato Valley is considered to have a potential beneficial use as municipal and domestic supply.	The text has been revised as requested.
4	**Table 4, Chemical Detected in Soil on a Site-Wide Basis, p 21:** Please add the mean and UCL95 information to this table of summary statistics for each of the chemicals detected.	The table has been revised as requested.
5	**Table 8, Comparison of Site-Wide Naturally Occurring Metal Concentration and Background Concentrations, p 29:** (a) Please incorporate the sediment acceptance criteria from the Water Board's July 2005 HWRP permit to provide another point of comparison. (b) Please include risk estimates for background levels of selenium. Background data from BRAC are fairly close to the levels presented for the Ballfields property. Some discussion regarding the hazard quotients at the detection levels for background would be helpful.	The sediment acceptance criteria from the Water Boards July 2005 HWRP permit have been added to Table 8 as another point of comparison to levels present in site soil. A comparison of site-related concentrations to ambient background and the HWRP sediment acceptance criteria is provided below. Note that except for lead and silver, maximum concentrations are less than or consistent with the HWRP sediment criteria.

<table>
<tr><th>Comment Number</th><th>Comment</th><th>Response</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Chemical</th><th>Max Concentration in Surface Samples (mg/kg)</th><th>95% UCL in Surface Soil Samples (mg/kg)</th><th>BRAC Ambient Background (mg/kg)</th><th>HWRP Dredged Material Acceptance Criteria (mg/kg)</th></tr>
<tr><td>Mercury</td><td>0.48</td><td>0.14</td><td>0.42</td><td>0.43</td></tr>
<tr><td>Silver</td><td>4.81</td><td>2.55</td><td>0.21</td><td>0.58</td></tr>
<tr><td>Nickel</td><td>67</td><td>39</td><td>113.5</td><td>112</td></tr>
<tr><td>Thallium</td><td>0.185</td><td>0.12</td><td>ND</td><td>ND</td></tr>
<tr><td>Barium</td><td>275</td><td>147</td><td>189.9</td><td>ND</td></tr>
<tr><td>Arsenic</td><td>12.3</td><td>5.48</td><td>16.7</td><td>15.3</td></tr>
<tr><td>Chromium (total)</td><td>114</td><td>72.5</td><td>107</td><td>112</td></tr>
<tr><td>Vanadium</td><td>94.7</td><td>61</td><td>118</td><td>ND</td></tr>
<tr><td>Beryllium</td><td>1.1</td><td>0.8</td><td>1.03</td><td>ND</td></tr>
<tr><td>Cobalt</td><td>55.8</td><td>14</td><td>27.6</td><td>ND</td></tr>
<tr><td>Antimony</td><td>0.67</td><td>0.26</td><td>0.37</td><td>ND</td></tr>
<tr><td>Cadmium</td><td>1.4</td><td>0.44</td><td>0.64</td><td>1.2</td></tr>
<tr><td>Copper</td><td>62</td><td>25.9</td><td>48.8</td><td>68.1</td></tr>
<tr><td>Lead</td><td>234</td><td>66.7</td><td>30.7</td><td>43.2</td></tr>
<tr><td>Selenium</td><td>0.7</td><td>0.44</td><td>ND</td><td>0.64</td></tr>
<tr><td>Zinc</td><td>110</td><td>73.8</td><td>92</td><td>158</td></tr>
</table>

The potential risk from selenium at the detection limit of the background data set has been calculated and incorporated into the discussion of the PA/SI Report.
</td></tr>
<tr><td>6</td><td>Section 4.4, Comparison to Historical Data, Area-wide Total DDT, page 32: The report does not include data collected by the U.S. Army corps of Engineers, due to concerns about the quality of the data. We have approved the use of these data for decision-making on the adjacent BRAC parcel. Including these data in calculating a site-wide average for total DDTs in soils would improve the understanding of the spatial distribution of this contaminant for the entire site</td><td>The evaluation of total DDT at the site has been updated by incorporating the DDT data (0-8 inches bgs) collected during the March 2003 Army BRAC sampling activities for derivation of the 95th UCL.</td></tr>
</table>

ATTACHMENT 1.

CHEMICAL SURROGATES RECOMMENDED BY DTSC FOR USE IN HUMAN HEALTH RISK ASSESSMENT

Table 1. Recommendations on Chemical Surrogate for the HHRA Provided by DTSC

COPC	Chemical Surrogate	Soil PRG mg/kg	Tap Water PRG, µg/l	Rationale
2-methylnaphthalene	naphthalene	1.7	9.3E-2	– structural similarity
acenaphthylene	acenaphthene	3.7E+3	3.7E+2	– structural similarity – non-carcinogen
acetophenone	benzaldehyde	6.1E+3	3.6E+3	– structural similarity – same oral reference dose
benzo(g,h,i)perylene	pyrene	2.3E+3	1.8E+2	– relative location of aromatic rings – non-carcinogen
phenanthrene	anthracene	2.2E+4	1.8E+3	– structural similarity – non-carcinogen
4-chloro-3-methylphenol	2-chlorophenol	6.3E+1	3.0E+1	– similar route of exposure, and metabolism – bioaccumulation

ATTACHMENT 2.

ECOLOGICAL RISK ASSESSMENT
REVISED TABLES AND SUPPORT INFORMATION

(Revised) Table 17. Contaminant Concentrations for Biota (Food Items) Based on Uptake Factors[a]

Analyte	Plants (C_p) mg/kg dry weight	Reference	Worms (C_w) mg/kg dry weight	Reference	Small Mammals (C_m) mg/kg dry weight	Reference
Antimony	0.011	U.S. EPA, 2005	0.26	U.S. EPA, 2005	0.001[c]	U.S. EPA, 2005
Cadmium	0.395	Bechtel-Jacobs, 1998	4.3	Sample et al., 1999	0.192	Sample et al., 1998b
Chromium	2.97	Bechtel-Jacobs, 1998	22.2	Sample et al., 1999	5.38	Sample et al., 1998b
Cobalt	0.11	Bechtel-Jacobs, 1999	1.7	Sample et al., 1998a	0.36	Sample et al., 1998b
Copper	7.03	Bechtel-Jacobs, 1998	13.3	Sample et al., 1999	12.3	Sample et al., 1998b
Lead	2.8	Bechtel-Jacobs, 1998	23.9	Sample et al., 1999	6.9	Sample et al., 1998b
Mercury	0.093	Bechtel-Jacobs, 1998	0.24	Sample et al., 1998a	0.008	Sample et al., 1998b
Selenium	0.207	Bechtel-Jacobs, 1998	0.51	Sample et al., 1999	0.486	Sample et al., 1998b
Silver	0.036	Bechtel-Jacobs, 1998	5.22	Sample et al., 1998a	0.01	Sample et al., 1998b
Thallium	0[b]	Efroymson et al., 1997	0.032	USACHPPM, 2004	0.012	Sample et al., 1998b
Zinc	52.4	Bechtel-Jacobs, 1998	350.7	Sample et al., 1999	106.4	Sample et al., 1998b
Total PCBs	0.00035	Travis and Arms, 1988	0.055	Jager, 1998	0.245	Travis and Arms, 1988
Total DDx compounds	0.02	Bechtel-Jacobs, 1998	1.38	U.S. EPA, 2005	0.72[c]	U.S. EPA, 2005
2,6 - DNT	0.44	Travis and Arms, 1988	0.19	Assumed [d]	0[b]	ATSDR, 1998
HMX	4.67	CH2MHill, 2005	0.69	CH2MHill, 2005	0[b]	Assumed to be negligible

(a) Full uptake factor equations are presented in Appendix H.
(b) Assumed to be negligible.
(c) The regression equation cited in U.S. EPA (2005) for uptake to small mammals is based on a diet that is comprised of 100% worms. To be consistent with wildlife at the site for this evaluation, small mammal concentrations were based on a herbivorous diet (i.e., 100% plants).
(d) Due to the lack of adequate uptake factors to worms, their concentrations were conservatively assumed to be equivalent to soil concentrations (U.S. EPA, 2005)

(Revised) Table H-1. Uptake Factors for Concentrations in Food Items

Bioaccumulative Contaminant	Soil Conc. 95th UCL	Soil to Plants (C_p)	Reference	Soil to Worms (C_w)	Reference	Soil to Small Mammals (C_m)	Reference
Antimony	0.264	=EXP(0.938*LN(0.264)-3.233)	U.S. EPA, 2005	=0.264	U.S. EPA, 2005	=0.001*50*0.011[(a)]	U.S. EPA, 2005
Cadmium	0.436	=EXP(0.546*LN(0.436)-0.475)	Bechtel-Jacobs, 1998	=EXP(0.795*LN(0.436)+2.114)	Sample et al., 1999	=EXP(0.4723*LN(0.436)-1.2571)	Sample et al., 1998b
Chromium	72.486	=0.041*72.486	Bechtel-Jacobs, 1998	=0.306*72.486	Sample et al., 1999	=EXP(0.7338*LN(72.486)-1.4599)	Sample et al., 1998b
Cobalt	14.014	=0.0075*14.014	Bechtel-Jacobs, 1999	=0.122*14.014	Sample et al., 1998a	=EXP(1.307*LN(14.014)-4.4669)	Sample et al., 1998b
Copper	25.878	=EXP(0.394*LN(25.878)+0.668)	Bechtel-Jacobs, 1998	=0.515*25.878	Sample et al., 1999	=EXP(0.1444*LN(25.878)+2.042)	Sample et al., 1998b
Lead	66.740	=EXP(0.561*LN(66.74)-1.328)	Bechtel-Jacobs, 1998	=EXP(0.807*LN(66.74)-0.218)	Sample et al., 1999	=EXP(0.4422*LN(66.74)+0.0761)	Sample et al., 1998b
Mercury	0.143	=0.652*0.143	Bechtel-Jacobs, 1998	=1.693*0.143	Sample et al., 1998a	=0.0543*0.143	Sample et al., 1998b
Selenium	0.443	=EXP(1.104*LN(0.443)-0.677)	Bechtel-Jacobs, 1998	=EXP(0.733*LN(0.443)-0.075)	Sample et al., 1999	=EXP(0.3764*LN(0.443)-0.4158)	Sample et al., 1998b
Silver	2.550	=0.014*2.55	Bechtel-Jacobs, 1998	=2.045*2.55	Sample et al., 1998a	=0.004*2.55	Sample et al., 1998b
Thallium	0.121	0	Efroymson et al., 1997	=0.263*0.121	USACHPPM, 2004	=0.102*0.121	Sample et al., 1998b
Zinc	73.803	=EXP(0.554*LN(73.803)+1.575)	Bechtel-Jacobs, 1998	=EXP(0.328*LN(73.803)+4.449)	Sample et al., 1999	=EXP(0.0706*LN(73.803)+4.3632)	Sample et al., 1998b
Total DDT	0.121	=EXP(0.7524*LN(0.121)-2.5119)	Bechtel-Jacobs, 1998	=EXP(0.8561*LN(0.121)+2.1287)	U.S. EPA, 2005	=EXP(0.663*LN(0.02)+2.3833)[(a)]	U.S. EPA, 2005
2,6-DNT	0.185	=2.35*0.185	Travis and Arms, 1988	=0.185	Assumed	0	ATSDR
HMX	0.690	=EXP(1.818+0.7458*LN(0.69))	CH2MHill, 2005	=0.69	CH2MHill, 2005	0	Assumed negligible

DDT - dichlorodiphenyltrichloroethane
2,6-DNT – 2,6-dinitrotoluene
EXP – exponential
LN – natural log
PCB – polychlorinated biphenyl
C_s – concentration in soil
C_p – concentration in plant
C_w – concentration in worm
C_m- concentration in mammal

(a) The regression equation cited in U.S. EPA (2005) for uptake to small mammals is based on a diet that is comprised of 100% worms. To be consistent with wildlife at the site for this evaluation, small mammal concentrations were based on a herbivorous diet (i.e., 100% plants).

(Revised) Table I-1. Dose Model Calculations

Species	Chemical	C_{soil} mg/kg	BW kg	IR_{soil} kd/day	C_{plant} mg/kg	C_{worm} mg/kg	C_{mammal} mg/kg	P_{plant} %	P_{worm} %	P_{mammal} %	IR kg/day	SUF	Dose mg/kg-day	TRV_{low}[(c)] mg/kg bw-day	TRV_{high}[(c)] mg/kg bw-day	HQ_{low}	HQ_{high}
Vole	Antimony	0.26	0.026	0.0003	0.011	0.26	0.0006	1	0	0	0.012	1	0.008	0.059	0.59	1.40E-01	1.40E-02
	Cadmium	0.44	0.026	0.0003	0.395	4.3	0.192	1	0	0	0.012	1	0.187	0.060	2.640	3.12E+00	7.10E-02
	Chromium	72.49	0.026	0.0003	2.97	22.2	5.38	1	0	0	0.012	1	2.207	3.280	13.140	6.73E-01	1.68E-01
	Lead	66.74	0.026	0.0003	2.8	23.9	6.9	1	0	0	0.012	1	2.062	1.000	240.640	2.06E+00	8.57E-03
	Mercury	0.14	0.026	0.0003	0.093	0.24	0.008	1	0	0	0.012	1	0.045	0.027	0.270	1.65E+00	1.65E-01
	Selenium	0.44	0.026	0.0003	0.207	0.51	0.486	1	0	0	0.012	1	0.101	0.050	1.210	2.01E+00	8.32E-02
	Silver	2.55	0.026	0.0003	0.036	5.22	0.01	1	0	0	0.012	1	0.046	22.000	220.000	2.09E-03	2.09E-04
	Thallium	0.12	0.026	0.0003	0	0.032	0.012	1	0	0	0.012	1	0.001	0.480	1.430	2.91E-03	9.75E-04
	Zinc	73.80	0.026	0.0003	52.4	350.7	106.4	1	0	0	0.012	1	25.036	9.600	411.000	2.61E+00	6.09E-02
	Total DDT	0.12	0.026	0.0003	0.02	1.38	0.72	1	0	0	0.012	1	0.011	0.800	16.000	1.33E-02	6.65E-04
	2,6-DNT	0.19	0.026	0.0003	0.44	0.19	0	1	0	0	0.012	1	0.205	0.200	1.500	1.03E+00	1.37E-01
	HMX	0.69	0.026	0.0003	4.67	0.69	0	1	0	0	0.012	1	2.163	1.000	5.000	2.16E+00	4.33E-01
Robin[(a)] (100% worm)	Antimony	0.26	0.083	0.0004	0.011	0.26	0.0006	0	1	0	0.004	1	0.014	NA	NA	ND	ND
	Cadmium	0.44	0.083	0.0004	0.395	4.3	0.192	0	1	0	0.004	1	0.209	0.080	10.400	2.62E+00	2.01E-02
	Chromium	72.49	0.083	0.0004	2.97	22.2	5.38	0	1	0	0.004	1	1.419	1.000	5.000	1.42E+00	2.84E-01
	Copper	25.88	0.083	0.0004	7.03	13.3	12.3	0	1	0	0.004	1	0.766	2.300	52.300	3.33E-01	1.46E-02
	Lead	66.74	0.083	0.0004	2.8	23.9	6.9	0	1	0	0.004	1	1.473	1.600	8.750	9.21E-01	1.68E-01
	Mercury	0.14	0.083	0.0004	0.093	0.24	0.008	0	1	0	0.004	1	0.012	0.039	0.180	3.14E-01	6.81E-02
	Selenium	0.44	0.083	0.0004	0.207	0.51	0.486	0	1	0	0.004	1	0.027	0.230	0.930	1.16E-01	2.87E-02
	Silver	2.55	0.083	0.0004	0.036	5.22	0.01	0	1	0	0.004	1	0.264	NA	NA	ND	ND
	Thallium	0.12	0.083	0.0004	0	0.032	0.012	0	1	0	0.004	1	0.002	NA	NA	ND	ND
	Zinc	73.80	0.083	0.0004	52.4	350.7	106.4	0	1	0	0.004	1	17.257	17.200	172.000	1.00E+00	1.00E-01
	Total DDT	0.12	0.083	0.0004	0.02	1.38	0.72	0	1	0	0.004	1	0.067	0.009	1.500	7.45E+00	4.47E-02
	2,6-DNT	0.19	0.083	0.0004	0.44	0.19	0	0	1	0	0.004	1	0.010	NA	NA	ND	ND
	HMX	0.69	0.083	0.0004	4.67	0.69	0	0	1	0	0.004	1	0.037	NA	NA	ND	ND
Robin[(b)] (50% plant, 50% worm)	Antimony	0.26	0.083	0.0004	0.011	0.26	0.0006	0.5	0.5	0	0.004	1	0.008	NA	NA	ND	ND
	Cadmium	0.44	0.083	0.0004	0.395	4.3	0.192	0.5	0.5	0	0.004	1	0.115	0.080	10.400	1.44E+00	1.11E-02
	Chromium	72.49	0.083	0.0004	2.97	22.2	5.38	0.5	0.5	0	0.004	1	0.956	1.000	5.000	9.56E-01	1.91E-01
	Copper	25.88	0.083	0.0004	7.03	13.3	12.3	0.5	0.5	0	0.004	1	0.615	2.300	52.300	2.67E-01	1.18E-02
	Lead	66.74	0.083	0.0004	2.8	23.9	6.9	0.5	0.5	0	0.004	1	0.965	**1.600**	8.750	6.03E-01	1.10E-01

(Revised) Table I-1. Dose Model Calculations (continued)

Species	Chemical	C_{soil} mg/kg	BW kg	IR_{soil} kd/day	C_{plant} mg/kg	C_{worm} mg/kg	C_{mammal} mg/kg	P_{plant} %	P_{worm} %	P_{mammal} %	IR kg/day	SUF	Dose mg/kg-day	TRV_{low} [c] mg/kg bw-day	TRV_{high} [c] mg/kg bw-day	HQ_{low}	HQ_{high}
	Mercury	0.14	0.083	0.0004	0.093	0.24	0.008	0.5	0.5	0	0.004	1	0.009	0.039	0.180	2.23E-01	4.84E-02
	Selenium	0.44	0.083	0.0004	0.207	0.51	0.486	0.5	0.5	0	0.004	1	0.019	0.230	0.930	8.44E-02	2.09E-02
	Silver	2.55	0.083	0.0004	0.036	5.22	0.01	0.5	0.5	0	0.004	1	0.139	NA	NA	ND	ND
	Thallium	0.12	0.083	0.0004	0	0.032	0.012	0.5	0.5	0	0.004	1	0.001	NA	NA	ND	ND
	Zinc	73.80	0.083	0.0004	52.4	350.7	106.4	0.5	0.5	0	0.004	1	10.069	17.200	172.000	5.85E-01	5.85E-02
	Total DDT	0.12	0.083	0.0004	0.02	1.38	0.72	0.5	0.5	0	0.004	1	0.034	0.009	1.500	3.81E+00	2.29E-02
	2,6-DNT	0.19	0.083	0.0004	0.44	0.19	0	0.5	0.5	0	0.004	1	0.016	NA	NA	ND	ND
Raccoon	Antimony	0.26	5.7	0.03	0.011	0.26	0.0006	0.5	0.5	0	0.3	1	0.009	0.059	0.59	1.45E-01	1.45E-02
	Cadmium	0.44	5.7	0.03	0.395	4.3	0.192	0.5	0.5	0	0.3	1	0.126	0.060	2.640	2.10E+00	4.77E-02
	Chromium	72.49	5.7	0.03	2.97	22.2	5.38	0.5	0.5	0	0.3	1	1.044	3.280	13.140	3.18E-01	7.94E-02
	Copper	25.88	5.7	0.03	7.03	13.3	12.3	0.5	0.5	0	0.3	1	0.671	2.670	632.000	2.51E-01	1.06E-03
	Lead	66.74	5.7	0.03	2.8	23.9	6.9	0.5	0.5	0	0.3	1	1.054	1.000	240.640	1.05E+00	4.38E-03
	Mercury	0.14	5.7	0.03	0.093	0.24	0.008	0.5	0.5	0	0.3	1	0.010	0.027	0.270	3.53E-01	3.53E-02
	Selenium	0.44	5.7	0.03	0.207	0.51	0.486	0.5	0.5	0	0.3	1	0.021	0.050	1.210	4.24E-01	1.75E-02
	Silver	2.55	5.7	0.03	0.036	5.22	0.01	0.5	0.5	0	0.3	1	0.152	22.000	220.000	6.90E-03	6.90E-04
	Thallium	0.12	5.7	0.03	0	0.032	0.012	0.5	0.5	0	0.3	1	0.001	0.480	1.430	3.08E-03	1.03E-03
	Zinc	73.80	5.7	0.03	52.4	350.7	106.4	0.5	0.5	0	0.3	1	10.996	9.600	411.000	1.15E+00	2.68E-02
	Total DDT	0.12	5.7	0.03	0.02	1.38	0.72	0.5	0.5	0	0.3	1	0.037	0.800	16.000	4.69E-02	2.34E-03
	2,6-DNT	0.19	5.7	0.03	0.44	0.19	0	0.5	0.5	0	0.3	1	0.018	0.200	1.500	8.78E-02	1.17E-02
	HMX	0.69	5.7	0.03	4.67	0.69	0	0.5	0.5	0	0.3	1	0.145	1.000	5.000	1.45E-01	2.89E-02
Owl	Antimony	0.26	0.16	0.0004	0.011	0.26	0.0006	0.5	0.2	0.3	0.02	1	0.008	NA	NA	ND	ND
	Cadmium	0.44	0.16	0.0004	0.395	4.3	0.192	0.5	0.2	0.3	0.02	1	0.140	0.080	10.400	1.76E+00	1.35E-02
	Chromium	72.49	0.16	0.0004	2.97	22.2	5.38	0.5	0.2	0.3	0.02	1	1.124	1.000	5.000	1.12E+00	2.25E-01
	Copper	25.88	0.16	0.0004	7.03	13.3	12.3	0.5	0.2	0.3	0.02	1	1.298	2.300	52.300	5.64E-01	2.48E-02
	Lead	66.74	0.16	0.0004	2.8	23.9	6.9	0.5	0.2	0.3	0.02	1	1.198	**1.600**	8.750	7.49E-01	1.37E-01

(Revised) Table I-1. Dose Model Calculations (continued)

Species	Chemical	C_{soil} mg/kg	BW kg	IR_{soil} kd/day	C_{plant} mg/kg	C_{worm} mg/kg	C_{mammal} mg/kg	P_{plant} %	P_{worm} %	P_{mammal} %	IR kg/day	SUF	Dose mg/kg-day	TRV_{low} [(c)] mg/kg bw-day	TRV_{high} [(c)] mg/kg bw-day	HQ_{low}	HQ_{high}
Owl	Mercury	0.14	0.16	0.0004	0.093	0.24	0.008	0.5	0.2	0.3	0.02	1	0.012	0.039	0.180	3.20E-01	6.93E-02
	Selenium	0.44	0.16	0.0004	0.207	0.51	0.486	0.5	0.2	0.3	0.02	1	0.045	0.230	0.930	1.96E-01	4.84E-02
	Silver	2.55	0.16	0.0004	0.036	5.22	0.01	0.5	0.2	0.3	0.02	1	0.140	NA	NA	ND	ND
	Thallium	0.12	0.16	0.0004	0	0.032	0.012	0.5	0.2	0.3	0.02	1	0.002	NA	NA	ND	ND
	Zinc	73.80	0.16	0.0004	52.4	350.7	106.4	0.5	0.2	0.3	0.02	1	16.217	17.200	172.000	9.43E-01	9.43E-02
	Total DDT	0.12	0.16	0.0004	0.02	1.38	0.72	0.5	0.2	0.3	0.02	1	0.063	0.009	1.500	7.01E+00	4.20E-02
	2,6-DNT	0.19	0.16	0.0004	0.44	0.19	0	0.5	0.2	0.3	0.02	1	0.033	NA	NA	ND	ND
	HMX	0.69	0.16	0.0004	4.67	0.69	0	0.5	0.2	0.3	0.02	1	0.311	NA	NA	ND	ND
Harrier	Antimony	0.26	0.35	0.0006	0.011	0.26	0.0006	0	0	1	0.03	1	0.001	NA	NA	ND	ND
	Cadmium	0.44	0.35	0.0006	0.395	4.3	0.192	0	0	1	0.03	1	0.017	0.080	10.400	2.15E-01	1.65E-03
	Chromium	72.49	0.35	0.0006	2.97	22.2	5.38	0	0	1	0.03	1	0.585	1.000	5.000	5.85E-01	1.17E-01
	Copper	25.88	0.35	0.0006	7.03	13.3	12.3	0	0	1	0.03	1	1.099	2.300	52.300	4.78E-01	2.10E-02
	Lead	66.74	0.35	0.0006	2.8	23.9	6.9	0	0	1	0.03	1	0.706	**1.600**	8.750	4.41E-01	8.07E-02
	Mercury	0.14	0.35	0.0006	0.093	0.24	0.008	0	0	1	0.03	1	0.001	0.039	0.180	2.39E-02	5.18E-03
	Selenium	0.44	0.35	0.0006	0.207	0.51	0.486	0	0	1	0.03	1	0.042	0.230	0.930	1.84E-01	4.56E-02
	Silver	2.55	0.35	0.0006	0.036	5.22	0.01	0	0	1	0.03	1	0.005	NA	NA	ND	ND
	Thallium	0.12	0.35	0.0006	0	0.032	0.012	0	0	1	0.03	1	0.001	NA	NA	ND	ND
	Zinc	73.80	0.35	0.0006	52.4	350.7	106.4	0	0	1	0.03	1	9.247	17.200	172.000	5.38E-01	5.38E-02
	Total DDT	0.12	0.35	0.0006	0.02	1.38	0.72	0	0	1	0.03	1	0.062	0.009	1.500	6.88E+00	4.13E-02
	2,6-DNT	0.19	0.35	0.0006	0.44	0.19	0	0	0	1	0.03	1	0.0003	NA	NA	ND	ND
	HMX	0.69	0.35	0.0006	4.67	0.69	0	0	0	1	0.03	1	0.0012	NA	NA	ND	ND

Notes: Shaded cells indicate an HQ above 1
Bolded lead TRV for birds is from U.S. EPA, 2005.

NA – not available

ND – not determined

(a) assumes only an invertivorous diet for the robin

(b) assumes an omnivorous diet for the robin

(c) For mammal receptors: TRVs for cadmium, copper, lead, mercury, selenium, thallium, zinc, and total DDT were obtained from U.S. EPA Region 9 Navy/BTAG; TRVs for antimony were obtained from U.S. EPA, 2005; TRVs for chromium were from Sample et al., 1996; TRVs for silver came from ATSDR, 1990; TRVs for 2,6-DNT were from ATSDR, 1998; and TRVs for HMX were from USACHPPM, 2001.
For avian receptors: cadmium, copper, mercury, selenium, xinc, and total DDT were obtained from U.S. EPA Region 9 Navy/BTAG; TRVs for chromium were obtained from Sample et. al., 1996; and the TRVs for lead were from U.S. EPA, 2005.

(Revised) Table K-1. Hazard Quotients for Background Concentrations

Species	Chemical units	C_{soil} mg/kg	BW kg	IR_{soil} kd/day	C_{plant} mg/kg	C_{worm} mg/kg	C_{mammal} mg/kg	P_{plant} %	P_{worm} %	P_{mammal} %	IR kg/day	SUF	Dose mg/kg-day	TRV_{low} [(a)] mg/kg bw-day	TRV_{high} [(a)] mg/kg bw-day	HQ_{low}	HQ_{high}
Vole	Antimony	0.37	0.026	0.0003	0.016	0.37	0.001	1	0	0	0.012	1	0.012	0.059	0.59	1.98E-01	1.98E-02
	Cadmium	0.64	0.026	0.0003	0.49	5.8	0.23	1	0	0	0.012	1	0.232	0.060	2.640	3.87E+00	8.79E-02
	Chromium	107	0.026	0.0003	4.39	32.7	7.16	1	0	0	0.012	1	3.261	3.280	13.140	9.94E-01	2.48E-01
	Cobalt	27.6	0.026	0.0003	0.21	3.4	0.88	1	0	0	0.012	1	0.415	1.200	20.000	3.46E-01	2.08E-02
	Copper	48.8	0.026	0.0003	9.02	25.1	13.5	1	0	0	0.012	1	4.726	2.670	632.000	1.77E+00	7.48E-03
	Lead	30.7	0.026	0.0003	1.81	12.7	4.9	1	0	0	0.012	1	1.190	1.000	240.640	1.19E+00	4.94E-03
	Mercury	0.42	0.026	0.0003	0.27	0.71	0.023	1	0	0	0.012	1	0.131	0.027	0.270	4.86E+00	4.86E-01
	Silver	0.21	0.026	0.0003	0	0.43	0.001	1	0	0	0.012	1	0.004	22.000	220.000	1.73E-04	1.73E-05
	Zinc	92	0.026	0.0003	59.1	377	108	1	0	0	0.012	1	28.338	9.600	411.000	2.95E+00	6.90E-02
Robin	Antimony	0.37	0.083	0.0004	0.016	0.37	0.001	0.5	0.5	0	0.004	1	0.011	NA	NA	ND	ND
	Cadmium	0.64	0.083	0.0004	0.49	5.8	0.23	0.5	0.5	0	0.004	1	0.155	0.080	10.400	1.93E+00	1.49E-02
	Chromium	107	0.083	0.0004	4.39	32.7	7.16	0.5	0.5	0	0.004	1	1.409	1.000	5.000	1.41E+00	2.82E-01
	Cobalt	27.6	0.083	0.0004	0.21	3.4	0.88	0.5	0.5	0	0.004	1	0.220	7.610	76.100	2.89E-02	2.89E-03
	Copper	48.8	0.083	0.0004	9.02	25.1	13.5	0.5	0.5	0	0.004	1	1.057	2.300	52.300	4.60E-01	2.02E-02
	Lead	30.7	0.083	0.0004	1.81	12.7	4.9	0.5	0.5	0	0.004	1	0.498	**1.600**	8.750	3.11E-01	5.69E-02
	Mercury	0.42	0.083	0.0004	0.27	0.71	0.023	0.5	0.5	0	0.004	1	0.172	0.039	0.180	4.40E+00	9.54E-01
	Silver	0.21	0.083	0.0004	0	0.43	0.001	0.5	0.5	0	0.004	1	0.011	NA	NA	ND	ND
	Zinc	92	0.083	0.0004	59.1	377	108	0.5	0.5	0	0.004	1	10.952	17.200	172.000	6.37E-01	6.37E-02
Raccoon	Antimony	0.37	5.7	0.03	0.016	0.37	0.001	0.5	0.5	0	0.3	1	0.012	0.059	0.59	2.05E-01	2.05E-02
	Cadmium	0.64	5.7	0.03	0.49	5.8	0.23	0.5	0.5	0	0.3	1	0.169	0.060	2.640	2.81E+00	6.39E-02
	Chromium	107	5.7	0.03	4.39	32.7	7.16	0.5	0.5	0	0.3	1	1.539	3.280	13.140	4.69E-01	1.17E-01
	Cobalt	27.6	5.7	0.03	0.21	3.4	0.88	0.5	0.5	0	0.3	1	0.240	1.200	20.000	2.00E-01	1.20E-02
	Copper	48.8	5.7	0.03	9.02	25.1	13.5	0.5	0.5	0	0.3	1	1.155	2.670	632.000	4.32E-01	1.83E-03
	Lead	30.7	5.7	0.03	1.81	12.7	4.9	0.5	0.5	0	0.3	1	0.543	1.000	240.640	5.43E-01	2.26E-03
	Mercury	0.42	5.7	0.03	0.27	0.71	0.023	0.5	0.5	0	0.3	1	0.028	0.027	0.270	1.04E+00	1.04E-01
	Silver	0.21	5.7	0.03	0	0.43	0.001	0.5	0.5	0	0.3	1	0.013	22.000	220.000	5.68E-04	5.68E-05
	Zinc	92	5.7	0.03	59.1	377	108	0.5	0.5	0	0.3	1	11.961	9.600	411.000	1.25E+00	2.91E-02
Owl	Antimony	0.37	0.16	0.0004	0.016	0.37	2E-05	0.5	0.2	0.3	0.02	1	0.011	NA	NA	ND	ND

(Revised) Table K-1. Hazard Quotients for Background Concentrations (continued)

Species	Chemical	C_{soil} mg/kg	BW kg	IR_{soil} kd/day	C_{plant} mg/kg	C_{worm} mg/kg	C_{mammal} mg/kg	P_{plant} %	P_{worm} %	P_{mammal} %	IR kg/day	SUF	Dose mg/kg-day	TRV_{low} [(a)] mg/kg bw-day	TRV_{high} [(a)] mg/kg bw-day	HQ_{low}	HQ_{high}
Owl (cont'd)	Cadmium	0.64	0.16	0.0004	0.49	5.8	0.23	0.5	0.2	0.3	0.02	1	0.186	0.080	10.400	2.32E+00	1.79E-02
	Chromium	107	0.16	0.0004	4.39	32.7	7.16	0.5	0.2	0.3	0.02	1	1.628	1.000	5.000	1.63E+00	3.26E-01
	Cobalt	27.6	0.16	0.0004	0.21	3.4	0.88	0.5	0.2	0.3	0.02	1	0.200	7.610	76.100	2.63E-02	2.63E-03
	Copper	48.8	0.16	0.0004	9.02	25.1	13.5	0.5	0.2	0.3	0.02	1	1.820	2.300	52.300	7.91E-01	3.48E-02
	Lead	30.7	0.16	0.0004	1.81	12.7	4.9	0.5	0.2	0.3	0.02	1	0.691	**1.600**	8.750	4.32E-01	7.90E-02
	Mercury	0.42	0.16	0.0004	0.27	0.71	0.023	0.5	0.2	0.3	0.02	1	0.112	0.039	0.180	7.03E-02	6.25E-01
	Silver	0.21	0.16	0.0004	0	0.43	0.001	0.5	0.2	0.3	0.02	1	0.012	NA	NA	ND	ND
	Zinc	92	0.16	0.0004	59.1	377	108	0.5	0.2	0.3	0.02	1	17.399	17.200	172.000	1.01E+00	1.01E-01
Harrier	Antimony	0.37	0.35	0.0006	0.016	0.37	0.001	0	0	1	0.03	1	0.001	NA	NA	ND	ND
	Cadmium	0.64	0.35	0.0006	0.49	5.8	0.23	0	0	1	0.03	1	0.021	0.080	10.400	2.60E-01	2.00E-03
	Chromium	107	0.35	0.0006	4.39	32.7	7.16	0	0	1	0.03	1	0.797	1.000	5.000	7.97E-01	1.59E-01
	Cobalt	27.6	0.35	0.0006	0.21	3.4	0.88	0	0	1	0.03	1	0.123	7.610	76.100	1.61E-02	1.61E-03
	Copper	48.8	0.35	0.0006	9.02	25.1	13.5	0	0	1	0.03	1	1.241	2.300	52.300	5.39E-01	2.37E-02
	Lead	30.7	0.35	0.0006	1.81	12.7	4.9	0	0	1	0.03	1	0.473	**1.600**	8.750	2.95E-01	5.40E-02
	Mercury	0.42	0.35	0.0006	0.27	0.71	0.023	0	0	1	0.03	1	0.055	0.039	0.180	1.40E+00	6.24E-03
	Silver	0.21	0.35	0.0006	0	0.43	0.001	0	0	1	0.03	1	0.000	NA	NA	ND	ND
	Zinc	92	0.35	0.0006	59.1	377	108	0	0	1	0.03	1	9.415	17.200	172.000	5.47E-01	5.47E-02

Notes: Shaded cells indicated an HQ above 1.

Bolded lead TRV for birds is from U.S. EPA, 2005.

(a) For mammal receptors: TRVs for cadmium, copper, lead, mercury, selenium, thallium, zinc, and total DDT were obtained from U.S. EPA Region 9 Navy/BTAG; TRVs for antimony were obtained from U.S. EPA, 2005; TRVs for chromium were from Sample et al., 1996; TRVs for silver came from ATSDR, 1990; TRVs for 2,6-DNT were from ATSDR, 1998; and TRVs for HMX were from USACHPPM, 2001.

For avian receptors: cadmium, copper, mercury, selenium, xinc, and total DDT were obtained from U.S. EPA Region 9 Navy/BTAG; TRVs for chromium were obtained from Sample et. al., 1996; and the TRVs for lead were from U.S. EPA, 2005.

Table 1. Comparison of Soil VOC Concentrations to Ecological TECs for the Inhalation Pathway

Analyte	Detection Frequency	Maximum Concentration		NOAEL TEC[(a)] (mg/m^3)	Receptor	Reference
		Soil (mg/kg)	Estimated Soil Gas (mg/m^3)			
Acetone	4/32	0.044	0.430	550	Mouse	ATSDR, 1994[(b)]
Methylene chloride	1/32	0.0035J	1.565	63	Rat (Sprague-Dawley)	ATSDR, 2000[(c)]
m,p-Xylenes	1/32	0.002J	0.501	63	Rat (CD)	ATSDR, 2005[(d)]
o-Xylenes	1/32	0.0011J	0.199	63	Rat (CD)	ATSDR, 2005[(d)]

(a) Threshold Effect Concentration (TEC); reported No Observed Adverse Effect Level (NOAEL) effect concentrations adjusted by the fraction of hours per day and number of days per week test organisms were exposed.

(b) Chronic (critical lifestage) study (12 days through days 6-17 of gestation) conducted by NTP (1988, as cited in ATSDR, 1994) that reported significantly increased incidence of late resorption and decreased fetal weight at the 6,600 ppm but not 2,200 ppm treatment levels; mice were exposed for 7 days/week for 6 hours/day.

(c) Chronic (2 year) study conducted by Burek et al. (1984; as cited in ATSDR, 2000) documented 90% mortality at the 3500 ppm treatment level; a NOAEL of 350 was estimated using a NOAEL/LOAEL extrapolation factor of 10; rats were exposed 5 days/week for 6 hours/day.

(d) Subchronic (166 days) study conducted by Bio/dynamics (1983; as cited in ATSDR, 2005) demonstrated a 7% decrease in fetal weight at the 500 ppm but not the 250 ppm treatment level; rats were exposed 7 days/week for 6 hours/day.

References:

Agency for Toxic Substances and Disease Registry (ATSDR), 1994. Toxicological Profile for Acetone; PB/95/100095/AS,U.S. Department of Health and Human Services, Public Health Service; available at: http://www.atsdr.cdc.gov/toxprofiles/tp21.pdf.

ATSDR, 2000. Toxicological Profile for Methylene Chloride; PB/2000/108026, U.S. Department of Health and Human Services, Public Health Service; available at: http://www.atsdr.cdc.gov/toxprofiles/tp14-p.pdf.

ATSDR, 2005. Toxicological Profile for Xylenes; PB/95/264404, U.S. Department of Health and Human Services, Public Health Service; available at: http://www.atsdr.cdc.gov/toxprofiles/tp71.pdf.

Bio/dynamics, 1983. Parental and fetal reproduction toxicity study in rats with mixed xylenes; submitted to U.S. EPA under TSCA Section FYI. FYI00002091.

Burek, J.D., K.D.Nitschke, T.J. Bell, et al., 1984. Methylene chloride: A two-year inhalation toxicity and oncogenicity study in rats and hamsters; Fund Appl Toxicol 4:30-47.

NTP. 1988. National Toxicology Program - report no. PNL-6768. Inhalation developmental toxicology studies: Teratology study of acetone in mice and rats. Research Triangle Park, NC: U.S.Department of Health and Human Services, Public Health Service, National Institute of Health. NTIS DE89-00567 1.

Responses to Additional DTSC Comments on the Draft Preliminary Assessment/Site Inspection (PA/SI) Report [dated August 24, 2005] for the Ballfields Parcels at the DoDHF Novato

Comment Number	Comment	Response
Comments Issued by Dr. Beckye Stanton (California Department of Fish and Game) during the January 11th BCT Meeting and summarized in subsequent emails		
1	The use of the 95% UCL in the assessment is acceptable, but only the chemicals of potential ecological concern (COPECs) exceeding an HQ of one need to be further evaluated using the 95% UCL, and the assessment should still include the evaluation of maximum chemical concentrations as was done in the Draft PA/SI.	The Navy will present HQs from maximum chemical concentrations and from 95% UCLs.
2	There is concern about the use of the lead EPA Eco-SSL TRV value for birds rather than the BTAG low TRV.	The Navy will evaluate lead using both TRV values in the Draft Final PA/SI so a range of HQs can be presented.
3	PCBs and PAHs should be included in the dose assessment even though the screening benchmarks are not exceeded.	The Navy will evaluate total PCBs and PAHs in the dose assessment models for birds and mammals. Given the limited information on the uptake of toxicity of PAHs to wildlife, evaluation of the PAHs will be conducted by combining the PAHs into two groups: one summing the low-molecular-weight PAHs (LPAHs) and another summing the high-molecular-weight PAHs (HPAHs). The sum of ALL LPAHs and ALL HPAHs will be used to derive the exposure point concentrations for the respective groups. HPAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3cd)pyrene, and pyrene. LPAHs include phenanthrene, anthracene, naphthalene, and acenaphthylene. The low TRV and high TRV that will be used to assess each PAH group by receptor class along with the sources of each TRV are summarized in Table 1. Note that Total PCBs will be evaluated in the dose models using the Navy BTAG TRVs for birds and mammals.

<table>
<tr><th>Comment Number</th><th>Comment</th><th>Response</th></tr>
<tr><td>3 (Continued)</td><td></td><td>Table 1. Summary of TRVs for PAHs
<table>
<tr><th rowspan="2">COPEC</th><th colspan="2">Birds</th><th colspan="2">Mammals</th></tr>
<tr><th>Low</th><th>High</th><th>Low</th><th>High</th></tr>
<tr><td>LPAHs</td><td>26.9 (a)</td><td>269 (a)</td><td>50 (c)</td><td>150 (c)</td></tr>
<tr><td>HPAHs</td><td>32.5 (b)</td><td>325 (b)</td><td>1.31 (c)</td><td>32.8 (c)</td></tr>
</table>
(a) Wildlife International Ltd. 1985. An acute oral toxicity study on the bobwhite with naphthalene. Final Report, submitted to W.R. Landis Associates, Inc. Valdosta, GA.
(b) Patton, J.F., and M.P. Dieter. 1980. Effects of Petroleum Hydrocarbons on Hepatic Functions in the Duck. Comparative Biochemistry and Physiology, 65(c): 33-26.
(c) California Department of Toxic Substances Control (DTSC). 2001. Currently Recommended U.S. EPA Region 9 Biological Technical Assistance Group (BTAG) Mammalian and Avian Toxicity Reference Values (TRVs) – Revision Date November 21, 2002.</td></tr>
<tr><td>4</td><td>There is concern regarding vertical migration of groundwater and surface water mixing still exists.</td><td>The Navy has provided the most informed response possible with respect to this issue given the information that is currently available; Mr. Kaiser indicated that he and Ms. McGarry should discuss this issue.</td></tr>
<tr><td colspan="3">Comment Issued by Ms. Theresa McGarry (California Department of Toxic Substances Control) verbally and discussed during the February 8th, 2006 BCT Meeting</td></tr>
<tr><td>5</td><td>How do detected concentrations of arsenic in groundwater at the Ballfields parcel compare to all the information we have regarding background concentrations at Hamilton?</td><td>First and foremost, the low yield and high salinity of groundwater present at the Ballfields Parcels precludes its use for any beneficial purposes including drinking water, agriculture, irrigation, industrial, or any other domestic use. The RWQCB has agreed “groundwater is not considered a potential source of drinking water;” and the following additional information was discussed during the February 8, 2006 BRAC Cleanup Team (BCT) Meeting, further supporting there is no potential beneficial use of the groundwater in the future:

• Historically, the entire region (e.g. Bel Marin Keys) is known for insufficient groundwater yield and that is the reason why the land was originally transferred to the Army by the local farmers.</td></tr>
</table>

Comment Number	Comment	Response
5 (Continued)	How do detected concentrations of arsenic in groundwater at the Ballfields parcel compare to all the information we have regarding background concentrations at Hamilton?	• Marin County permitting requirements for installation of groundwater production wells for any use would not be met based on site characteristics. • Future use of the property can not include anything other than open space/wetland habitat based on local zoning laws and agreements between the Navy and California Coastal Conservancy. Therefore, the property could not be used for commercial/industrial, agricultural, or residential purposes even if the groundwater were acceptable for use. In any event the Navy has researched existing metals data in groundwater that has been collected through the Army BRAC program, and reviewed the arsenic data collected from groundwater at the Ballfields Parcels. Here are the findings: • Limited metals data exists for non-filtered groundwater samples at Hamilton Field. Two unfiltered groundwater samples were collected in the vicinity of a former sewage treatment plant and returned arsenic results of 31 and 36 µg/L. The 95% Upper Confidence Limit (UCL) of arsenic detected in groundwater during the PA/SI field activities at the Ballfields Parcels is 47.9 µg/L and the mean is 29.8 µg/L, which is below the levels measured at the former sewage treatment plant. The Army BRAC data was obtained from the *Comprehensive Remedial Investigation Report, BRAC Property, Hamilton Army Airfield, Novato, California* issued by IT Corporation in 1999. • In January 2002 the Army collected dissolved (i.e., filtered) arsenic groundwater data from 17 monitoring wells prior to well destruction activities. Arsenic was detected in 12 of 17 wells at concentrations ranging from 1.5J to 14.1 µg/L. This data was obtained from the *Groundwater Data Report, Final Well Sampling for HAFF, Marin County, California* issued by the US

Comment Number	Comment	Response
		Army Corps of Engineers Sacramento District in July 2002.
5 (Continued)	How do detected concentrations of arsenic in groundwater at the Ballfields parcel compare to all the information we have regarding background concentrations at Hamilton?	• The groundwater sampling conducted at the Ballfields Parcels was accomplished using open boreholes and temporary slotted PVC screen. Field personnel observed suspended solids in the groundwater samples, and given that background levels of arsenic are known to exist in soils it is reasonable to measure arsenic in the unfiltered, turbid groundwater samples. • The General Services Administration (GSA) Phase I cleanup goal for arsenic in groundwater was reported as 15,000 µg/L in the HAAF GSA Phase I Sale Area Proposed Residential Cleanup Goals for Soil and Groundwater (Woodward-Clyde, 1995). The Navy does not have a copy of this document to deduce exactly what exposure pathways were evaluated to develop the cleanup goal, but it is clear from the available information that these cleanup goals were agreed to by the California EPA.

Responses to Additional DTSC Comments on the Draft Final Preliminary Assessment/Site Inspection (PA/SI) Report [dated February 24, 2006] for the Ballfields Parcels at the DoDHF Novato

Comment Number	Comment	Response
Comments Issued by Dr. Beckye Stanton (California Department of Fish and Game) in an email dated March 1, 2006, as summarized here		
1	The overall eco risk conclusions of NFA (p 77) are not sufficiently justified from a risk assessment perspective.	While acknowledging that the ecological risk evaluation resulted in some ambiguity concerning the true nature of the potential hazards posed by surface soil COPECs at the Ballfields Parcels, the Navy strongly believes that that this uncertainty is attributable to the conservative nature of the evaluation process rather than related to the possibility that an ecological hazard exists. The additional details provided in the responses below support the Navy's position that the unambiguous conclusion of a site-specific ecological assessment (based on more realistic exposure and effects information) would be that current and future site conditions do not pose a substantial hazard to ecological receptors. Planned restoration activities that will be conducted following property transfer will increase the certainty of this conclusion and further support a NFA decision for the Ballfields Parcels site.
2	The discussion of locations with concentrations greater than the 95UCL value is not very informative since low TRV HQ >1 with 95UCL. A back-calculated soil concentration at which low TRV HQ=1 (same process as used to develop FS goals) could be used to identify the locations with elevated concentrations.	The concentration distribution maps for lead and Total DDT (Figures 18 and 20, respectively) should be used in conjunction with the graphical comparisons of HQs_{low} for lead and Total DDT (Figures 16 and 17, respectively). The use of these figures together offers a general depiction of the areas with higher concentrations in relation to the relative magnitude of risk one could expect.
3	The discussion on the uncertainty based on the magnitude of difference between the low and high TRVs is also not valuable in supporting the NFA conclusion. The statement "it is unknown whether the dose estimate is approaching where first-effects may be found" should be removed since the Navy could add LOAEL values from the literature if they are looking to determine a lowest effects level. For lead, the BTAG NOAEL low TRV value (0.014 mg/kg-d) is estimated based on a LOAEL endpoint (0.14 mg/kg-d) in the Edens et al 1976 study with an uncertainty factor of 10. So using this LOAEL TRV of 0.14 mg/kg-d, HQs for the bird receptors with the 95UCL for lead are 6.89 (Robin	This particular uncertainty is meant to address the magnitude of the difference between the low TRV and high TRV, which corresponds to the relative degree of confidence that one has when interpreting the results of an HQ_{low} value. With regard to the lead TRV, the U.S. EPA TRV for lead (1.6 mg/kg bw-day) was developed following an extensive literature search and graphical plotting of various toxicity data, from which the TRV was selected as the highest bounded NOAEL, lower than the lowest bounded LOAEL for reproduction, growth, or survival. Thus, using the U.S. EPA lead TRV for birds to assess effects from lead to avian receptors at the Ballfields Parcels results in HQs of less than one for

Comment Number	Comment	Response
	50/50 diet), 10.5 (Robin 100 diet), 8.56 (owl), and 5.0 (harrier). So lead exposure still exceeds first-effects thresholds for birds.	all receptors.
4	Overall, the exceedance of low TRV HQ>1 for several chemicals, particularly lead (revetments 3-5) and total DDTs (perimeter drainage ditch), needs to be addressed.	The Phase I assessment for avian receptors evaluated exposure to lead using both the BTAG and U.S. EPA low TRVs. The HQs_{low} resulting from these TRVs were significantly different as noted in the report. Included in the text (Section 7.1.2) is a discussion regarding the variability of the low TRV for lead among the literature sources. The text notes that the BTAG TRV for lead is significantly lower than other widely accepted TRVs such as those from ORNL (Sample et al., 1996) (i.e., 1.13 mg/kg bw-day based on lead acetate) and the U.S. EPA Eco-SSL (2005) (i.e., 1.6 mg/kg bw-day). The text further points out that the U.S. EPA TRV for lead was selected as the highest bounded NOAEL, lower than the lowest bounded LOAEL for reproduction, growth, or survival and notes the general concerns about the BTAG TRV (DON, 1998) for birds make it difficult to adequately assess the risk from lead at the Ballfields Parcels, which presents a large amount of uncertainty with respect to interpreting the HQs. Based on the parallel evaluation using the avian Eco-SSL TRV for lead and the discussion surrounding the variability of the low TRV that is presented in the report, the Navy believes that lead does not pose a hazard to ecological receptors either currently or under future use assumptions Similarly, estimated HQs_{low} for Total DDT were greatest for avian receptors. These HQs were derived using toxicological data for the brown pelican, which is known to be among the most sensitive to this COPEC. Raptors (including the harrier) are also known to be sensitive to the endocrine disrupting properties of DDE; however, other bird taxa (e.g., the robin) are considerably less sensitive than the brown pelican. It is important to recognize that the only HQs that exceeded 1 were based on an estimated NOAEL, which provides a lower bound on the toxicological threshold dose for sensitive avian receptors.

Comment Number	Comment	Response
		There is also considerable uncertainty associated with the wildlife dose estimates [especially the uptake factors used to estimate the concentrations in prey tissue (plant, worm, small mammal)] in the absence of site-specific tissue concentrations. DDT is known to undergo an aging process in soil whereby it becomes sequestered in the soil matrix and becomes less bioavailable (Alexander 1995, 1997; Peterson et al. 1971; Robertson and Alexander 1998). It has been shown that the concentrations of DDT, DDE, DDD, and total DDT were consistently lower in earthworms exposed to these compounds that had persisted in soil for 49 years than in earthworms exposed to soil containing freshly added insecticides at the same concentration. The uptake percentages of DDT and related compounds by earthworms were in the range of 1.30–1.75% for the 49-year-aged soil, but were 4.00–15.2% for the freshly contaminated soil (Morrison et al. 1999). Based on these arguments, it is reasonable to assume that a more refined and realistic assessment of the actual hazards posed by DDT in surface soils at the Ballfields Parcels would conclude that they are of a *de minimis* nature.